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Interventions for female drug-using offenders (Review)

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[Intervention Review]

Interventions for female drug-using offenders

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ABSTRACT

Background

This review represents one in a family of three reviews focusing on the effectiveness of interventions in reducing drug use and criminal activity for offenders.

Objectives

To assess the effectiveness of interventions for female drug-using offenders in reducing criminal activity, or drug use, or both.

Search methods

We searched 12 electronic bibliographic databases up to February 2019.

Selection criteria

We included randomised controlled trials (RCTs).

Data collection and analysis

We used standard methodological procedures expected by Cochrane.

Main results

We included 13 trials with 2560 participants. Interventions were delivered in prison (7/13 studies, 53%) and community (6/13 studies, 47%) settings. The rating of bias was affected by the lack of clear reporting by authors, and we rated many items as 'unclear'.

In two studies (190 participants) collaborative case management in comparison to treatment as usual did not reduce drug use (risk ratio (RR) 0.65, 95% confidence interval (CI) 0.20 to 2.12; 1 study, 77 participants; low-certainty evidence), reincarceration at nine months (RR 0.71, 95% CI 0.32 to 1.57; 1 study, 77 participants; low-certainty evidence), and number of subsequent arrests at 12 months (RR 1.11, 95% CI 0.83 to 1.49; 1 study, 113 participants; low-certainty evidence).

One study (36 participants) comparing buprenorphine to placebo showed no significant reduction in self-reported drug use at end of treatment (RR 0.57, 95% CI 0.27 to 1.20) and three months (RR 0.58, 95% CI 0.25 to 1.35); very low-certainty evidence. No adverse events were reported.

One study (38 participants) comparing interpersonal psychotherapy to a psychoeducational intervention did not find reduction in drug use at three months (RR 0.67, 95% CI 0.30 to 1.50; low-certainty evidence).

One study (31 participants) comparing acceptance and commitment therapy (ACT) to a waiting list showed no significant reduction in self-reported drug use using the Addiction Severity Index (mean difference (MD) -0.04, 95% CI -0.37 to 0.29) and abstinence from drug use at six months (RR 2.89, 95% CI 0.73 to 11.43); low-certainty evidence.

One study (314 participants) comparing cognitive behavioural skills to a therapeutic community programme and aftercare showed no significant reduction in self-reported drug use (RR 0.86, 95% CI 0.58 to 1.27), re-arrest for any type of crime (RR 0.73, 95% CI 0.52 to 1.03); criminal activity (RR 0.80, 95% CI 0.63 to 1.03), or drug-related crime (RR 0.95, 95% CI 0.68 to 1.32). A significant reduction for arrested (not for parole) violations at six months follow-up was significantly in favour of cognitive behavioural skills (RR 0.43, 95% CI 0.25 to 0.77; very low-certainty evidence). A second study with 115 participants comparing cognitive behavioural skills to an alternative substance abuse treatment showed no significant reduction in reincarceration at 12 months (RR 0.70, 95% CI 0.43 to 1.12; low certainty-evidence.

One study (44 participants) comparing cognitive behavioural skills and standard therapy versus treatment as usual showed no significant reduction in Addiction Severity Index (ASI) drug score at three months (MD 0.02, 95% CI -0.05 to 0.09) and six months (MD -0.02, 95% CI -0.09 to 0.05), and incarceration at three months (RR 0.46, 95% CI 0.04 to 4.68) and six months (RR 0.51, 95% CI 0.20 to 1.27); very low-certainty evidence.

One study (171 participants) comparing a single computerised intervention versus case management showed no significant reduction in the number of days not using drugs at three months (MD -0.89, 95% CI -4.83 to 3.05; low certainty-evidence).

One study (116 participants) comparing dialectic behavioural therapy and case management (DBT-CM) versus a health promotion intervention showed no significant reduction at six months follow-up in positive drug testing (RR 0.67, 95% CI 0.43 to 1.03), number of people not using marijuana (RR 1.23, 95% CI 0.95 to 1.59), crack (RR 1.00, 95% CI 0.87 to 1.14), cocaine (RR 1.02, 95% CI 0.93 to 1.12), heroin (RR 1.05, 95% CI 0.98 to 1.13), methamphetamine (RR 1.02, 95% CI 0.87 to 1.20), and self-reported drug use for any drug (RR 1.20, 95% CI 0.92 to 1.56); very low-certainty evidence.

One study (211 participants) comparing a therapeutic community programme versus work release showed no significant reduction in marijuana use at six months (RR 1.03, 95% CI 0.19 to 5.65), nor 18 months (RR 1.00, 95% CI 0.07 to 14.45), heroin use at six months (RR 1.59, 95% CI 0.49 to 5.14), nor 18 months (RR 1.92, 95% CI 0.24 to 15.37), crack use at six months (RR 2.07, 95% CI 0.41 to 10.41), nor 18 months (RR 1.64, 95% CI 0.19 to 14.06), cocaine use at six months (RR 1.09, 95% CI 0.79 to 1.50), nor 18 months (RR 0.93, 95% CI 0.64 to 1.35). It also showed no significant reduction in incarceration for drug offences at 18 months (RR 1.45, 95% CI 0.87 to 2.42); with overall very low- to low-certainty evidence.

One study (511 participants) comparing intensive discharge planning and case management versus prison only showed no significant reduction in use of marijuana (RR 0.79, 95% CI 0.53 to 1.16), hard drugs (RR 1.12, 95% CI 0.88 to 1.43), crack cocaine (RR 1.08, 95% CI 0.75 to 1.54), nor positive hair testing for marijuana (RR 0.75, 95% CI 0.55 to 1.03); it found a significant reduction in arrests (RR 0.19, 95% CI 0.04 to 0.87), but no significant reduction in drug charges (RR 1.07, 95% CI 0.75 to 1.53) nor incarceration (RR 1.09, 95% CI 0.86 to 1.39); moderate-certainty evidence.

One narrative study summary (211 participants) comparing buprenorphine pre- and post-release from prison showed no significant reduction in drug use at 12 months post-release; low certainty-evidence. No adverse effects were reported.

Authors' conclusions

The studies showed a high degree of heterogeneity for types of comparisons, outcome measures and small samples. Descriptions of treatment modalities are required. On one outcome of arrest (no parole violations), we identified a significant reduction when cognitive behavioural therapy (CBT) was compared to a therapeutic community programme. But for all other outcomes, none of the interventions were effective. Larger trials are required to increase the precision of confidence about the certainty of evidence.

PLAIN LANGUAGE SUMMARY

Interventions for female drug-using offenders

What is the aim?

To assess the effectiveness of interventions to reduce drug use, criminal activity, or both, in women involved in the criminal justice system.

What is the key message?

We are uncertain whether the treatments reduce subsequent drug use, criminal activity, or both. We identified too few studies to evaluate whether the treatment
setting (for example, court or community) had an impact on the success of such programmes. The study sample sizes were small and the certainty of this evidence was very low. High quality research is required to evaluate the effectiveness of different treatment options.

What was studied?

We studied any intervention aimed at reducing drug use, criminal activity, or both. Many more people involved in the criminal justice system experience drug use compared to people who have no contact with the criminal justice system. Most of the interventions that are used to support the rehabilitation of drug use in the criminal justice system are aimed at men and not women. Women have different needs to men and existing schemes need to be evaluated and adapted to deal with the complexity of the kinds of problems that women experience in order to reduce female drug use, criminal activity, or both

What are the main results?

We found 13 trials including 2560 participants. The 13 trials included people who were assigned at random to one of two interventions, conducted mainly in the USA. Studies were conducted in prison and the community. Study participants received a range of different interventions in comparison to nothing, another intervention or treatment as usual.
The review shows that:

- when women engage with collaborative case management, it may make little or no difference to reducing drug use, reincarceration or rearrest in comparison to treatment as usual (low-certainty evidence);

- when women take buprenorphine, we are uncertain whether it reduces drug use in comparison to a placebo (very low-certainty evidence);

- when women take buprenorphine pre-release from prison, it may make little or no difference to reducing drug use or criminal activity in comparison to taking buprenorphine post-release from prison (low-certainty evidence);

- when women engage with interpersonal psychotherapy, it may make little or no difference to reducing a relapse into drug use in comparison to a psychoeducational intervention (low-certainty evidence);

- when women engage in acceptance and commitment therapy, it may make little or no difference to reducing drug use/ abstinence from drug use in comparison to a waiting list control (low-certainty evidence);

- when women engage with cognitive skills in comparison to a therapeutic community intervention, we are uncertain whether it produces a reduction in subsequent drug use, being rearrested, committing criminal activity or drug-related crimes (very low-certainty evidence);

- when women engage with cognitive skills in comparison to a therapeutic community intervention, it may reduce subsequent arrest (not parole violations) (very low-certainty evidence);

- when women engage with cognitive skills in comparison to standard therapy, we are uncertain whether it reduces subsequent drug use (very low-certainty evidence);

- when women engage with a single session of a computerised intervention, it may make little or no difference to reducing subsequent drug use (low-certainty evidence) in comparison to face-to-face case management;

- when women engage with dialectic behavioural therapy and case management, we are uncertain whether it produces a reduction in subsequent drug use in comparison to a health promotion scheme (very low-certainty evidence);

- when women engage in a therapeutic community programme, we are uncertain whether it reduces subsequent drug use and criminal activity in comparison to a work release programme (very low- to low-certainty evidence);

- when women engage with intensive discharge planning upon release, it probably does not reduce subsequent drug use and criminal activity in comparison to prison only (moderate-certainty evidence).

Funding sources were reported by all studies and included government and research/charitable foundations.

How up-to-date is this review?

February 2019.

Summary of findings for the main comparison. Collaborative case management compared to treatment as usual

Collaborative case management compared to treatment as usual

Patient or population: female offenders
Setting: probation in the community
Intervention: collaborative case management
Comparison: treatment as usual

Outcomes	Anticipated absolute effects* (95% CI)		Relative effect (95% CI)	№ of participants (studies)	Certainty of the evidence (GRADE)	Comments
	Risk with standard parole	Risk with collaborative case management				
Use of primary drug during 9 month follow-up	Study population		RR 0.65 (0.20 to 2.12)	77 (1 study)	Low[a]	
	158 per 1000	103 per 1000 (32 to 335)				
Reincarceration at 9 months follow-up	Study population		RR 0.71 (0.32 to 1.57)	77 (1 study)	Low[a],	
	289 per 1000	206 per 1000 (93 to 454)				
Number of arrests	Study population		RR 1.11 (0.83 to 1.49)	113 (1 study)	Low [a]	
	585 per 1000	649 per 1000 (485 to 872)				

*__The risk in the intervention group__ (and its 95% CI) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

CI: confidence interval; **RR:** risk ratio.

GRADE Working Group grades of evidence
High certainty: we are very confident that the true effect lies close to that of the estimate of the effect.
Moderate certainty: we are moderately confident in the effect estimate; the true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.
Low certainty: our confidence in the effect estimate is limited; the true effect may be substantially different from the estimate of the effect.
Very low certainty: we have very little confidence in the effect estimate; the true effect is likely to be substantially different from the estimate of effect.

[a]Downgraded two levels for imprecision: optimal Information size not met.

Summary of findings 2. Community-based buprenorphine compared to placebo

Community-based buprenorphine compared to placebo

Patient or population: females offenders
Setting: community
Intervention: community-based buprenorphine
Comparison: placebo

Outcomes	Anticipated absolute effects* (95% CI)		Relative effect (95% CI)	№ of participants (studies)	Certainty of the evidence (GRADE)	Comments
	Risk with placebo	Risk with community-based buprenorphine				
End of treatment drug use	Study population		RR 0.57 (0.27 to 1.20)	36 (1 study)	Very low[a,b]	
	583 per 1000	333 per 1000 (158 to 700)				
Drug use at 3 months follow-up	Study population		RR 0.58 (0.25 to 1.35)	36 (1 study)	Very low[a,b]	
	500 per 1000	290 per 1000 (125 to 675)				

*__The risk in the intervention group__ (and its 95% CI) is based on the assumed risk in the comparison group and the __relative effect__ of the intervention (and its 95% CI).

CI: confidence interval; **RR:** risk ratio.

GRADE Working Group grades of evidence
High certainty: we are very confident that the true effect lies close to that of the estimate of the effect.
Moderate certainty: we are moderately confident in the effect estimate; the true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.
Low certainty: our confidence in the effect estimate is limited; the true effect may be substantially different from the estimate of the effect.
Very low certainty: we have very little confidence in the effect estimate; the true effect is likely to be substantially different from the estimate of effect.

[a]Downgraded one level for high risk of bias on selection bias and incomplete outcome data.
[b]Downgraded two levels for imprecision: optimal Information size not met.

Summary of findings 3. Interpersonal psychotherapy compared to psychoeducational control

Interpersonal psychotherapy compared to psychoeducational control

Patient or population: summary findings of female review
Setting: prison
Intervention: interpersonal psychotherapy
Comparison: psychoeducational control

Outcomes	Anticipated absolute effects* (95% CI)		Relative effect (95% CI)	№ of participants (studies)	Certainty of the evidence (GRADE)	Comments
	Risk with psychoeducational control	Risk with interpersonal psychotherapy				
Relapse to drug use at 3 months	Study population		RR 0.67 (0.30 to 1.50)	38 (1 study)	Low[a]	
	474 per 1000	317 per 1000 (142 to 711)				

*__The risk in the intervention group__ (and its 95% CI) is based on the assumed risk in the comparison group and the __relative effect__ of the intervention (and its 95% CI).

CI: confidence interval; **RR:** risk ratio.

GRADE Working Group grades of evidence

High certainty: we are very confident that the true effect lies close to that of the estimate of the effect.
Moderate certainty: we are moderately confident in the effect estimate; the true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.
Low certainty: our confidence in the effect estimate is limited; the true effect may be substantially different from the estimate of the effect.
Very low certainty: we have very little confidence in the effect estimate; the true effect is likely to be substantially different from the estimate of effect.

[a]Downgraded two levels for imprecision as optimal information size not met.

Summary of findings 4. Acceptance and commitment therapy (ACT) compared to waiting list control

Acceptance and commitment therapy (ACT) compared to waiting list control

Patient or population: summary findings of female review
Setting: prison
Intervention: ACT
Comparison: waiting list control

Outcomes	Anticipated absolute effects* (95% CI)		Relative effect (95% CI)	№ of participants (studies)	Certainty of the evidence (GRADE)	Comments
	Risk with ACT	Risk with cognitive behavioural therapy				
Abstinence from drug use at 6 months	Study population		RR 2.89 (0.73 to 11.43)	31 (1 study)	Low[a]	
	154 per 1000	445 per 1000 (112 to 1000)				
ASI drug score at 6 months	-	MD 0.04 lower (0.37 lower to 0.29 higher)	-	31 (1 study)	Low[a]	

***The risk in the intervention group** (and its 95% CI) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

CI: confidence interval; **RR:** risk ratio.

GRADE Working Group grades of evidence

High certainty: we are very confident that the true effect lies close to that of the estimate of the effect.
Moderate certainty: we are moderately confident in the effect estimate; the true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.
Low certainty: our confidence in the effect estimate is limited; the true effect may be substantially different from the estimate of the effect.
Very low certainty: we have very little confidence in the effect estimate; the true effect is likely to be substantially different from the estimate of effect.

[a]Downgraded two levels for imprecision as optimal information size not met.

Summary of findings 5. Cognitive behavioural therapy and other therapies compared to prison therapeutic community

Cognitive behavioural therapy and other therapies compared to prison therapeutic community

Patient or population: summary findings of female review
Setting: prison
Intervention: cognitive behavioural therapy and other therapies
Comparison: prison therapeutic community

Outcomes	Anticipated absolute effects* (95% CI)		Relative effect (95% CI)	№ of participants (studies)	Certainty of the evidence (GRADE)	Comments
	Risk with prison therapeutic community	Risk with cognitive behavioural therapy and other therapies				

Reincarcerated at 12 months after parole	Study population		RR 0.70 (0.43 to 1.12)	115 (1 study)	Low[a]
	455 per 1000	318 per 1000 (195 to 509)			
Arrested for any crime at 6 months	Study population		RR 0.73 (0.52 to 1.03)	314 (1 study)	Very low[a,b]
	160 per 1000	110 per 1000 (70 to 174)			
Criminal activity at 6 months	Study population		RR 0.80 (0.63 to 1.03)	314 (1 study)	Very low[a,b]
	245 per 1000	182 per 1000 (128 to 258)			
Drug-related crime at 6 months	Study population		RR 0.95 (0.68 to 1.32)	314 (1 study)	Very low[a,b]
	184 per 1000	160 per 1000 (103 to 250)			
Arrested (not parole violation) at 6 months	212 per 1000	91 per 1000 (53 to 163)	RR 0.43 (0.25 to 0.77)	314 (1 study)	Very low[a,b]
Self-reported drug use at 6 months	Study population		RR 0.86 (0.58 to 1.27)	314 (1 study)	Very low[a,b]
	135 per 1000	105 per 1000 (62 to 178)			

*__The risk in the intervention group__ (and its 95% CI) is based on the assumed risk in the comparison group and the __relative effect__ of the intervention (and its 95% CI).

CI: confidence interval; **RR:** risk ratio.

GRADE Working Group grades of evidence

High certainty: we are very confident that the true effect lies close to that of the estimate of the effect.
Moderate certainty: we are moderately confident in the effect estimate; the true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.
Low certainty: our confidence in the effect estimate is limited; the true effect may be substantially different from the estimate of the effect.
Very low certainty: we have very little confidence in the effect estimate; the true effect is likely to be substantially different from the estimate of effect.

[a]Downgraded one level for imprecision as optimal information size not met.
[b]Downgraded one level for risk of bias (incomplete outcome data).

Summary of findings 6. Cognitive behavioural therapy and standard therapy compared to treatment as usual

Cognitive behavioural therapy and standard therapy compared to treatment as usual

Patient or population: summary findings of female review
Setting: prison
Intervention: cognitive behavioural therapy and standard therapy
Comparison: treatment as usual

Outcomes	Anticipated absolute effects* (95% CI)		Relative effect (95% CI)	№ of participants (studies)	Certainty of the evidence (GRADE)	Comments
	Risk with treatment as usual	Risk with cognitive behavioural therapy and standard therapy				
Incarceration at 3 months	Study population		RR 0.46 (0.04 to 4.68)	44 (1 study)	Very low[a,b]	
	95 per 1000	44 per 1000 (4 to 446)				
Incarceration at 6 months	Study population		RR 0.51 (0.20 to 1.27)	44 (1 study)	Very low[a,b]	
	429 per 1000	219 per 1000 (86 to 544)				
ASI drug score at 3 months	-	MD 0.02 higher (0.05 lower to 0.09 higher)	-	44 (1 study)	Very low[a,b]	
ASI drug score at 6 months	-	MD 0.02 lower (0.09 lower to 0.05 higher)	-	44 (1 study)	Very low[a,b]	

*__The risk in the intervention group__ (and its 95% CI) is based on the assumed risk in the comparison group and the __relative effect__ of the intervention (and its 95% CI).

ASI: Addiction Severity Index **CI:** confidence interval; **MD**: mean difference: **RR:** risk ratio.

GRADE Working Group grades of evidence

High certainty: we are very confident that the true effect lies close to that of the estimate of the effect.
Moderate certainty: we are moderately confident in the effect estimate; the true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.
Low certainty: our confidence in the effect estimate is limited; the true effect may be substantially different from the estimate of the effect.
Very low certainty: we have very little confidence in the effect estimate; the true effect is likely to be substantially different from the estimate of effect.

[a]Downgraded two levels for imprecision as optimal information size not met.

[b]Downgraded for high risk of bias (detection bias).

Summary of findings 7. Single computerised session compared to single session of case management

Single computerised session compared to single session of case management

Patient or population: summary findings of female review
Setting: community
Intervention: single computerised session
Comparison: single session of case management

Outcomes	Anticipated absolute effects* (95% CI)		Relative effect (95% CI)	№ of participants (studies)	Certainty of the evidence (GRADE)	Comments
	Risk with single session of case management	Risk with single computerised session				
Number of days not using drugs (in the past 30 days) at 3 months	-	MD 0.89 lower (4.83 lower to 3.05 higher)	-	171 (1 study)	Low[a]	

*__The risk in the intervention group__ (and its 95% CI) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

CI: confidence interval; **MD**: mean difference.

GRADE Working Group grades of evidence

High certainty: we are very confident that the true effect lies close to that of the estimate of the effect.
Moderate certainty: we are moderately confident in the effect estimate; the true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.
Low certainty: our confidence in the effect estimate is limited; the true effect may be substantially different from the estimate of the effect.
Very low certainty: we have very little confidence in the effect estimate; the true effect is likely to be substantially different from the estimate of effect.

[a]Downgraded two levels for imprecision.

Summary of findings 8. Dialectic behaviour therapy with case management compared to a health promotion scheme

Dialectic behaviour therapy with case management compared to a health promotion scheme

Patient or population: summary findings of female review
Setting: community
Intervention: dialectic behaviour therapy with case management
Comparison: a health promotion scheme

Outcomes	Anticipated absolute effects* (95% CI)		Relative effect (95% CI)	№ of participants (studies)	Certainty of the evidence (GRADE)	Comments
	Risk with a health promotion scheme	Risk with dialectic behaviour therapy with case management				
Positive drug test using urine sample at 6 months	Study population		RR 0.67 (0.43 to 1.03)	116 (1 study)	Very low[a,b]	
	517 per 1000	347 per 1000 (222 to 533)				
Number not using marijuana at 6 months	Study population		RR 1.23 (0.95 to 1.59)	116 (1 study)	Very low[a,b]	
	603 per 1000	742 per 1000 (573 to 959)				
Number not using crack at 6 months	Study population		RR 1.00 (0.87 to 1.14)	116 (1 study)	Very low[a,b]	
	879 per 1000	879 per 1000 (765 to 1000)				
Number not using cocaine at 6 months	Study population		RR 1.02 (0.93 to 1.12)	116 (1 study)	Very low[a,b]	
	931 per 1000	950 per 1000 (866 to 1000)				
Number not using heroin at 6 months	Study population		RR 1.05 (0.98 to 1.13)	116 (1 study)	Very low[a,b]	
	948 per 1000	996 per 1000 (929 to 1000)				
Number not using methamphetamine at 6 months	Study population		RR 1.02 (0.87 to 1.20)	116 (1 study)	Very low[a,b]	
	828 per 1000	844 per 1000 (720 to 993)				
Self-report of no drug use at 6 months	Study population		RR 1.20 (0.92 to 1.56)	116 (1 study)	Very low[a,b]	
	603 per 1000	724 per 1000 (555 to 941)				

*__The risk in the intervention group__ (and its 95% CI) is based on the assumed risk in the comparison group and the __relative effect__ of the intervention (and its 95% CI).

CI: confidence interval; **RR:** risk ratio.

GRADE Working Group grades of evidence

High certainty: we are very confident that the true effect lies close to that of the estimate of the effect.
Moderate certainty: we are moderately confident in the effect estimate; the true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.
Low certainty: our confidence in the effect estimate is limited; the true effect may be substantially different from the estimate of the effect.
Very low certainty: we have very little confidence in the effect estimate; the true effect is likely to be substantially different from the estimate of effect.

[a]Downgraded two levels for imprecision as optimal information size not met.
[b]Downgraded one level for high risk of bias (incomplete outcome data).

Summary of findings 9. Therapeutic community compared to work release

Therapeutic community compared to work release

Patient or population: summary findings of female review
Setting: prison
Intervention: therapeutic community
Comparison: work release

Outcomes	Anticipated absolute effects* (95% CI)		Relative effect (95% CI)	№ of participants (studies)	Certainty of the evidence (GRADE)	Comments
	Risk with work release	Risk with therapeutic community				
Incarcerated for drug offences at 18 months	Study population		RR 1.45 (0.87 to 2.42)	112 (1 study)	Very low[a]	
	300 per 1000	435 per 1000 (261 to 726)				
Marijuana use at 6 months	Study population		RR 1.03 (0.19 to 5.65)	51 (1 study)	Very low[a]	
	97 per 1000	100 per 1000 (18 to 547)				
Marijuana use at 18 months	Study population		RR 1.00 (0.07 to 14.45)	28 (1 study)	Very low[a]	
	71 per 1000	71 per 1000 (5 to 1000)				
Heroin use at 6 months	Study population		RR 1.59	68	Very low[a]	

	114 per 1000	182 per 1000 (56 to 587)	(0.49 to 5.14)	(1 study)	
Heroin use at 18 months	Study population		RR 1.92 (0.24 to 15.37)	37 (1 study)	Very low[a]
	83 per 1000	160 per 1000 (20 to 1,000)			
Crack use at 6 months	Study population		RR 2.07 (0.41 to 10.41)	55 (1 study)	Very low[a]
	71 per 1000	148 per 1000 (29 to 744)			
Crack use at 18 months	Study population		RR 1.64 (0.19 to 14.06)	34 (1 study)	Very low[a]
	83 per 1000	137 per 1000 (16 to 1000)			
Cocaine use at 6 months	Study population		RR 1.09 (0.79 to 1.50)	211 (1 study)	Low[b]
	403 per 1000	439 per 1000 (318 to 605)			
Cocaine use at 18 months	Study population		RR 0.93 (0.64 to 1.35)	139 (1 study)	Very low[a]
	468 per 1000	435 per 1000 (299 to 631)			

*__The risk in the intervention group__ (and its 95% CI) is based on the assumed risk in the comparison group and the __relative effect__ of the intervention (and its 95% CI).

CI: confidence interval; **RR:** risk ratio.

GRADE Working Group grades of evidence

High certainty: we are very confident that the true effect lies close to that of the estimate of the effect.
Moderate certainty: we are moderately confident in the effect estimate; the true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.
Low certainty: our confidence in the effect estimate is limited; the true effect may be substantially different from the estimate of the effect.
Very low certainty: we have very little confidence in the effect estimate; the true effect is likely to be substantially different from the estimate of effect.

[a]Downgraded two levels for imprecision as optimal information size not met.
[b]Downgraded one level for imprecision as optimal information size not met.

Summary of findings 10. Intensive discharge planning and case management compared to prison only

Intensive discharge planning and case management compared to prison only

Patient or population: summary findings of female review
Setting: prison into the community
Intervention: intensive discharge planning and case management
Comparison: prison only

Outcomes	Anticipated absolute effects* (95% CI)		Relative effect (95% CI)	№ of participants (studies)	Certainty of the evidence (GRADE)	Comments
	Risk with prison only	Risk with intensive discharge planning and case management				
Marijuana use	Study population		RR 0.79 (0.53 to 1.16)	511 (1 study)	Moderate[a]	
	186 per 1000	147 per 1000 (98 to 215)				
Hard drug use	Study population		RR 1.12 (0.88 to 1.43)	511 (1 study)	Moderate[a]	
	314 per 1000	352 per 1000 (277 to 450)				
Positive hair test for crack cocaine	Study population		OR 1.08 (0.75 to 1.54)	511 (1 study)	Moderate[a]	
	375 per 1000	393 per 1000 (310 to 480)				
Positive hair test for marijuana use	Study population		RR 0.75 (0.55 to 1.03)	511 (1 study)	Moderate[a]	
	269 per 1000	202 per 1000 (148 to 277)				
Arrested	Study population		RR 0.19 (0.04 to 0.87)	511 (1 study)	Moderate[a]	
	42 per 1000	8 per 1000 (2 to 36)				
Drug charge	Study population		RR 1.07 (0.75 to 1.53)	511 (1 study)	Moderate[a]	
	182 per 1000	195 per 1000 (136 to 278)				

Incarceration	Study population		RR 1.09 (0.86 to 1.39)	511 (1 study)	Moderate[a]
	326 per 1000	355 per 1000 (280 to 453)			

*__The risk in the intervention group__ (and its 95% CI) is based on the assumed risk in the comparison group and the __relative effect__ of the intervention (and its 95% CI).

CI: confidence interval; **OR**: odds ratio; **RR:** risk ratio.

GRADE Working Group grades of evidence

High certainty: we are very confident that the true effect lies close to that of the estimate of the effect.
Moderate certainty: we are moderately confident in the effect estimate; the true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.
Low certainty: our confidence in the effect estimate is limited; the true effect may be substantially different from the estimate of the effect.
Very low certainty: we have very little confidence in the effect estimate; the true effect is likely to be substantially different from the estimate of effect.

[a]Downgraded for risk of bias (detection bias).

Summary of findings 11. Pre- versus post-release buprenorphine use

Pre-release buprenorphine compared with post-release buprenorphine from prison in the community

Patient or population: 211 adults

Settings: in prison transition to the community

Intervention: pre-release buprenorphine

Comparison: post-release buprenorphine

Outcomes	Illustrative comparative risks* (95% CI)		Relative effect (95% CI)	No. of Participants (studies)	Certainty of the evidence (GRADE)	Comments
	Assumed risk	Corresponding risk				
Heroin use and positive urine screen testing	Narrative summary of the findings only. No differential effects were found on gender. All outcomes were P > 0.18			211 (1 study)	Low[a,b]	

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

CI: confidence interval.

GRADE Working Group grades of evidence

High certainty: we are very confident that the true effect lies close to that of the estimate of the effect.
Moderate certainty: we are moderately confident in the effect estimate; the true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.
Low certainty: our confidence in the effect estimate is limited; the true effect may be substantially different from the estimate of the effect.
Very low certainty: we have very little confidence in the effect estimate; the true effect is likely to be substantially different from the estimate of effect

[a]Downgraded one level for imprecision as optimal information size not met.
[b]Downgraded one level for risk of bias.

BACKGROUND

This review forms part of a family of three reviews, providing a close examination of the types of interventions that are effective in reducing drug use and criminal activity in drug-using offenders. The three reviews report on trials generating a number of publications and numerous comparisons (Perry 2015a; Perry 2019). Two of the three reviews represent a specific interest in pharmacological interventions, and offenders with concurrent mental health problems. All three reviews stem from an updated Cochrane Review (Perry 2006). We consider the effectiveness of interventions based on two key outcomes: drug use and criminal activity. We have presented here the revised methodology for this individual review focusing on the impact of interventions for female drug-using offenders.

Description of the condition

Within the criminal justice system, the number of women incarcerated for drug offences has significantly increased over the last decade (Carson 2018). The numbers of women in UK prisons has doubled since 1993, with women making up around 5% of the UK and 7% of the USA incarcerated population (Carson 2018; Guerino 2011; Ministry of Justice 2017). Around a quarter of all arrests are attributed to crimes committed by women (Carson 2018; FBI 2011).

Among women offenders, recidivism associated with drug-related violations is greater than those of men (32% versus 21%; Leukefeld 2009). Patterns of drug use in female offenders differs from that of the male population. Females have been observed to use cannabis less on average than men, but are more prone to using so-called 'harder' drugs, such as heroin and amphetamines. In the UK, nearly half of all women report needing help with a drug problem on entry to prison compared with one-third of all men (Forsythe 2009; Light 2013). Other factors that impact on drug use for women include mental illness, raising children, employment prospects, and patterns of offending (Salem 2013; Tsai 2013). Additionally, early victimisation and severity of addiction are stronger predictors of criminal activity and subsequent mental and physical health problems for women than for men (Bloom 2004; Messina 2007). Furthermore, women entering substance abuse treatment programmes in prison are at a substantial disadvantage compared with their male counterparts, because few programmes have been adapted to deal with the needs of women (Messina 2007). Few gender-sensitive programmes address drug use and recidivism behaviours, and a study using male parolees comments on how additional knowledge is required (Salem 2013).

Description of the intervention

There are many different treatments available for substance misuse (e.g. detoxification, and therapeutic communities) in the criminal justice system. This review includes 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 treatment interventions focusing on: therapeutic community and gender-responsive treatment programmes, community-based management, cognitive skills and cognitive behavioural therapy, including acceptance and commitment therapy (ACT) and dialectic behaviour therapy, pharmacological interventions (using buprenorphine), computerised interventions and interpersonal psychotherapy. The evidence supporting 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.

Previous meta-analyses and systematic reviews of therapeutic community interventions, specifically with aftercare, have shown modest effects in the reduction of recidivism and drug use (Mitchell 2012; Pearson 1999), and gender-responsive treatment programmes are designed to provide a secure environment for women offenders to safely discuss histories of trauma, abuse, and addiction without fear of judgement (Grella 2008).

Community-based management 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 USA has been applied in Treatment Accountability for Safer Communities (TASC) programmes (Marlowe 2003a), and has shown initial effectiveness, but without systematic evidence in support of the process. Contingency management, alongside voucher incentives have shown some modest effects. Meta-analyses work including 30 studies, showed that overall, use of voucher incentives generated significantly better outcomes than did control treatments. These results further support the efficacy of voucher incentive schemes and help to quantify the magnitude of its effects and suggest potential directions for future research (Lussier 2006).

Cognitive behavioural approaches, including self-monitoring, goal setting, self-control training, interpersonal skills training, relapse prevention, group work, lifestyle modification, and ACT, have shown signs of success with offenders generally (Lipsey 2007), but the evidence excluded evaluations focused specifically on drug-using offenders. Use of dialectical behavioural therapy (DBT) in prison settings has been used to teach those who are incarcerated how to dialectically think through and problem solve during conflicting situations (Berzins 2004).

There have been a number of pharmacological reviews focusing on the non-correctional population. Naltrexone maintenance treatment for opioid dependence (Amato 2005; Lobmaier 2008; Minozzi 2011), and the efficacy of methadone maintenance (Faggiano 2003; Marsch 1998; Mattick 2009), and buprenorphine maintenance (Mattick 2009), have been examined. Minozzi 2013 systematically reviewed the evidence on pharmacological maintenance for non-correctional pregnant women and identified three small trials from which they were unable to draw firm conclusions about the effectiveness of treatment. Other non-correctional reviews have investigated pharmacological interventions, but not specifically for female offenders. These have included evaluations of naltrexone maintenance treatment for opioid dependence (Lobmaier 2008), the efficacy of methadone maintenance including the management of opioid withdrawal (Amato 2013; Faggiano 2003; Marsch 1998, Mattick 2009), and buprenorphine maintenance and impact on dosage (Fareed 2012; Mattick 2009).

Internationally, methadone maintenance has been the primary choice for chronic opioid dependence in prisons and prisons, including those in the Netherlands, Australia, Spain and Canada, and it is being increasingly implemented in the criminal justice setting (Moller 2007; Stallwitz 2007). The USA has not generally

endorsed the use of methadone treatment, and only 12% of correctional settings offer this option for incarcerated inmates (Fiscella 2004). Reasons for this lack of expansion suggest that methadone amongst the public and criminal justice system providers has been considered a substitute for another addiction. In contrast, buprenorphine appears not to carry the same social stigma associated with methadone treatment and has been used in France, Austria and Puerto Rico (Catania 2003; Garcia 2007; Reynaud-Maurupt 2005). Naltrexone treatment has shown some promising findings, but associated problems surrounding high attrition and low medication compliance in the community and high mortality rates pose concerns (Gibson 2007; Minozzi 2011). Trials conducted in the criminal justice setting are still lacking, and continuity of care is considered crucial in the treatment of drug-involved offenders who move between the prison and the community.

Systematic reviews of self-paced computerised screening tools have been found to increase disclosure of personal information among women in healthcare settings, and two previous randomised controlled trials (RCTs) showed that they helped to initiate patient-provider discussions (Ahmed 2009; McMillan 2009; Nelson 2012), however, previous work with substance misusing women involved in the criminal justice system are yet to be explored (Gilbert 2015). Interpersonal psychotherapy has been used in the community with proven effectiveness with non-criminal justice settings. Such studies have not found interpersonal psychotherapy to be superior to other treatments, but few of these studies include female offenders (Johnson 2012).

How the intervention might work

Therapeutic community programmes have been used in the USA since the 1960s, and combined with work release programmes, they attempt to rehabilitate offenders via a supportive environment over a relatively long period of time (up to and beyond 5 years), typically encompassing the transition between the prison and the community (Prendergast 2011). The ethos of therapeutic community interventions is to focus on treatment of the whole self, such that residents are instrumental in running the therapeutic community (Mitchell 2012). Gender-responsive treatment is a theoretically-based programme which is used to develop trauma-informed services for women. In this review the development of gender-responsive treatments were based on the relational–cultural theory (Miller 1976), whereby the programme helps the women to describe the psychological development of their relationships and helps the connection to others.

Case management is used in the literature to describe a range of diverse practices and supervision models spanning a number of different services, including probation and those on parole. The process of case management is used to co-ordinate and integrate all aspects of community supervision, from the initial offender-needs assessment, through to programme delivery and completion of an order or sentencing requirement (Partridge 2004). Use of DBT-CM techniques in this review were derived from a nursing orientated theoretical framework linked to health-seeking and coping mechanisms (Lazarus 1984). The method includes modules of mindfulness, interpersonal effectiveness, distress tolerance and emotion regulation. The processes involved help to facilitate change in thoughts and emotions to produce the use of adaptive behaviours and cognitive ability which prevents the escalation of maladaptive behaviours (Shelton 2011). These techniques have shown a significant improvement in the numbers of factors which might link to an individuals level of risk (e.g. impulsivity, anger, locus of control, self-esteem and emotional regulation (Nee 2005). The trial within this review represents the first to be tested in a group of women with substance misuse problems under supervision in the community (Nyamathi 2017).

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 (Andrews 1990; Lipsey 1998; Lipsey 2007). Two major meta-analyses have examined the efficacy of ACT (Ost 2008; Powers 2009), and it is now recognised as 'empirically supported' by the United States Substance Abuse and Mental Health Sevice Administration (SAMHSA 2012). Nevertheless, the long-term evidence to support the efficacy of ACT is limited (Lanza 2014). Interpersonal psychotherapy addresses personal stress and life changes. The emphasis is to engage with clients to develop their network of social and peer support. A lack of support has been shown to associate with dropping out of addiction treatment and failure to maintain abstinence (Dobkin 2002; Holahan 2004).

Without exception, these programmes and community-based interventions have been used to a greater extent with male drug-using offenders, but to our knowledge little evidence has been collated about how these programmes and other available interventions have been adapted or used with female drug-using offenders. Given that very little is known about what interventions exist for female drug-using offenders, the focus of this review is to include all known interventions that have been applied, or specifically adapted for use with female drug-using offenders. Our only requirement of these programmes is that they are aimed at reducing drug use or criminal activity, or both.

Why it is important to do this review

The increasing numbers of females involved with the criminal justice system have high levels of drug use in combination with many other complex problems. Whilst previous research has evaluated treatment programmes for offenders more broadly, we know little about the challenges, treatment and rehabilitation opportunities for female offenders with drug misuse problems. We therefore believe that an evaluation of existing evidence on the impact of interventions for female drug-using offenders might be helpful in identifying treatments for reducing drug use and criminal activity in this vulnerable population.

OBJECTIVES

To assess the effectiveness of interventions for female drug-using offenders in reducing criminal activity, or drug use, or both.

METHODS

Criteria for considering studies for this review

Types of studies

Randomised controlled trials (RCTs).

Types of participants

We included female drug-using offenders in the review, regardless of age or ethnicity. Drug misuse included individuals using

occasional drugs, or who were dependent, or known to abuse drugs. We defined offenders as individuals who were subject to the criminal justice system. Individuals could reside in special hospitals, prisons, the community, or be diverted from court or placed on arrest referral schemes for treatment. The study setting could change throughout the process of the study. For example, people involved in the criminal justice system could begin in prison but progress through a work release project into a community setting. We included studies containing male participants in the review only when the trial results reported the outcomes separately by gender; in these instances we included only the results for the female participants in the review.

Types of interventions

Included interventions were designed, wholly or in part, to reduce, eliminate or prevent relapse to drug use or criminal activity, or both, among participants. We defined relapse in the case of individuals who may have returned to an incarcerated setting, or subsequently been arrested, or relapsed into drug misuse. We included a range of different types of interventions in the review.

Experimental interventions included in the review

- Any pharmacological intervention (e.g. buprenorphine, methadone)
- Any psychosocial intervention (e.g. therapeutic community programme, case management, cognitive behavioural therapy, interpersonal psychotherapy and motivational interviewing)

Control Interventions included in the review

- No treatment or waiting list control
- Minimal and/or alternative treatment (e.g. reporting use of a similar intervention, but less intense or using a different theoretical approach, but the same components and/or a different alternative intervention)
- Treatment as usual included any study that reported a combination and/or component of a (i) a psychological base intervention (e.g. anger management, motivational interviewing, counselling, aggression replacement, family therapy), (ii) an educational programme (e.g. health, substance abuse education on risky behaviour), and/or (iii) life skills (e.g. financial planning, employment skills, computer skills, interpersonal skills in interview)

Types of outcome measures

Primary outcomes

Where papers reported a number of different follow-up periods, we reported the longest time period, as we felt that such measures provided the most conservative estimate of effectiveness. Studies need not report both drug and criminal activity outcomes. If either of these were reported we included the study in the review.

- Drug use measures were reported as:
  - self-reported drug use (unspecified drug use, specific drug use not including alcohol, Addiction Severity Index (ASI) drug composite scores); and
  - biological drug use (measured by drug testing, using either urine or hair analysis).
- Criminal activity was measured by:
  - self-report or official report of criminal activity, (including arrest for any offence, drug offences and/or re-incarceration).

Search methods for identification of studies

Electronic searches

The updated searches identified records from 2014 to 6 February 2019.

- Cochrane Central Register of Controlled Trials (CENTRAL; 1980 to February 2019)
- MEDLINE (1966 to February 2019)
- Embase (1980 to February 2019)
- PsycINFO (1978 to February 2019)
- SciSearch (Science Citation Index) (1974 to February 2019)
- Social SciSearch (Social Science Citation Index) (1972 to February 2019)
- ASSIA (1987 to February 2019)
- NTIS (1964 to March 2014)[a]
- Sociological Abstracts (1963 to March 2014)[b]
- HMIC (to February 2019)
- PAIS (1972 to February 2019)
- Criminal Justice Abstracts (1968 to February 2019)
- LILACS (2004 to February 2019)
- Current Controlled Trials (December 2009)[c]
- SPECTR (March 2004)[d]
- CINAHLplus (to February 2019)
- ClinicalTrials.gov (clinicaltrials.gov) (to February 2019)
- World Health Organization (WHO) International Clinical Trials Registry Platform (ICTRP) (apps.who.int/trialsearch/) (to February 2019)

[a]Paid access only - insufficient resources to search.
[b]Not available to search through York University.
[c]No longer available to search.
[d]No public access through Campbell Collaboration website which previously hosted the database.

To update the review, we restricted the search strategy to studies that were published since the end date of the previous search (May 2014). We did not search a number of original databases indicated by the key at the end of the database list. One database (NTIS) was fee charging, the other three databases (Sociological Abstracts, Current controlled trials and SPECTR) were not available for searching due to changes in the provision of databases through the University of York.

We developed search strategies for each database to exploit the search engine most effectively and to make use of any controlled vocabulary. We included methodological search filters designed to identify RCTs. 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 substituted search terms based on existing versions. We did not place any language restrictions on identification and inclusion of studies in the review.

Details of the updated search strategies are listed in Appendix 1; Appendix 2; Appendix 3; Appendix 4; Appendix 5; Appendix 6; Appendix 7; Appendix 8; Appendix 9; Appendix 10; and Appendix 11.

Searching other resources

Reference checking

We scrutinised the reference lists of all retrieved articles for further references.

Personal communication

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

Data collection and analysis

Selection of studies

A team of review authors independently inspected the search hits by reading the titles and abstracts. Each potentially relevant study was obtained as a full-text article. Each article was independently assessed 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.

We divided the screening process into two key phases. Phase one used eight key questions reported in the original review.

Prescreening criteria: phase one

- Is the document an empirical study? If not, exclude the document.
- Does the study evaluate an intervention, a component of which is designed to reduce, eliminate, or prevent relapse with drug-using offenders?
- Are the participants referred by the criminal justice system at baseline?
- Does the study report pre- and postprogramme measures of drug use?
- Does the study report pre- and postprogramme measures of criminal behaviour?
- Is the study a RCT?
- Do the outcome measures refer to the same length of follow-up for the two groups?

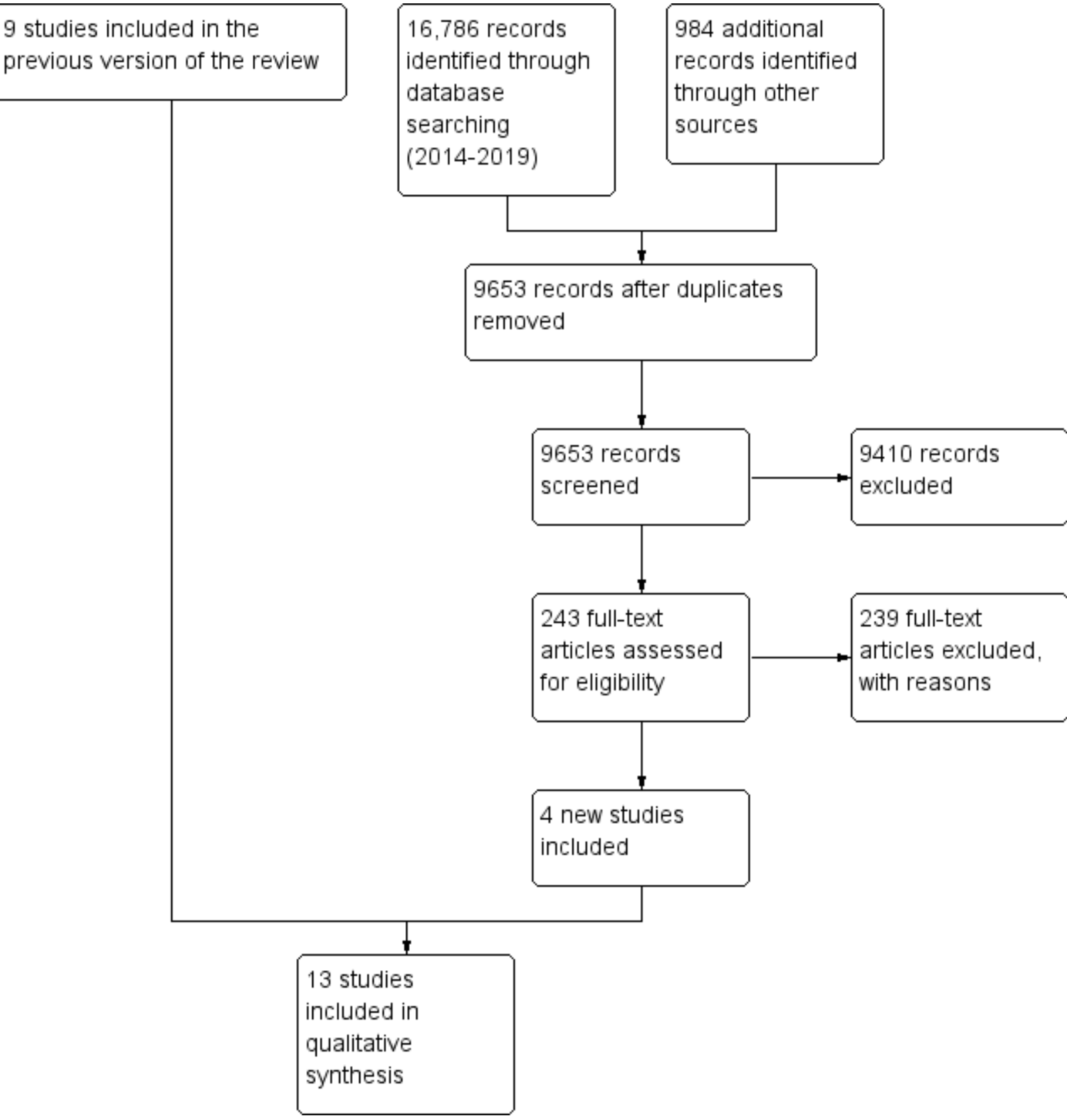
We then scrutinised papers included after phase one screening to assess phase two.

Prescreening: phase two

- Is the study population composed wholly of female participants? (If not, then refer to question below).
- Are the results of the study reported separately by gender? (If yes, then include the document).

See Figure 1 for the flow chart of the process.

Figure 1. Study flow diagram.



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 and subsequently checked them for agreement. The narrative tables included a presentation of the study details (for example author, year of publication, and country of study origin), study methods (for example, random assignment), participants (for example, number in sample, age, gender, ethnicity), interventions (for example, description, duration, intensity and setting), outcomes (for example, description, follow-up period, and reporting mechanism), and notes (for example, country and funding).

Assessment of risk of bias in included studies

The review team independently assessed the 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 a Cochrane Review is a two-part process, addressing seven specific domains, namely sequence generation and allocation concealment (selection bias), blinding of participants and providers (performance bias), blinding of outcome assessors (detection bias), incomplete outcome data (attrition bias), selective outcome reporting (reporting bias), and other potential sources of bias. The first part of the process involves describing what was reported to have happened in the study. The second part involves assigning a judgement relating to the risk of bias for that domain, in terms of low, high or unclear risk of bias. To make these judgements we used the criteria indicated by the *Cochrane Handbook for Systematic Reviews of Interventions* adapted to the addiction field (Higgins 2011). See Appendix 12 for details.

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

In psychosocial interventions participants and personnel cannot be blinded to the intervention; moreover we think that being aware of receiving a psychosocial treatment is part itself of the therapeutic effect; for these reasons, we rated them at low risk of performance bias.

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

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

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

Measures of treatment effect

We used mean differences (MDs) with 95% confidence intervals (CIs) for continuous outcomes measured on the same scale and standardised mean differences (SMDs) for outcomes measured on different scales. Higher scores for continuous measures are representative of greater harm. We present dichotomous outcomes as risk ratios (RRs), with 95% confidence interval (CIs).

Unit of analysis issues

To avoid double-counting of outcome measures (e.g. arrest and parole violation) and follow-up time periods (e.g. 12, 18 months) we checked all trials to ensure that multiple studies reporting the same evaluation did not contribute towards multiple estimates of programme effectiveness. We followed Cochrane guidance, and where appropriate, we combined intervention and control groups to create a single pair-wise comparison. Where this was not appropriate, we selected one treatment arm and excluded the others.

Dealing with missing data

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

Assessment of heterogeneity

We assessed heterogeneity using the I^2 statistic and Chi^2 statistic (Higgins 2011). We regarded heterogeneity as substantial if the I^2 statistic was greater than 50% or the P value lower than 0.10 for the Chi^2 test for heterogeneity (Deeks 2017). Following the guidance in the *Cochrane Handbook for Systematic Reviews of Interventions* (Deeks 2017), we distinguished the following values to denote no important, moderate, substantial, and considerable heterogeneity, respectively: 0% to 40%, 30% to 60%, 50% to 90%, and 75% to 100%.

Data synthesis

We planned to use Review Manager 5 software to perform a series of meta-analyses for continuous and dichotomous outcome measures (Review Manager 2014). We planned to use a random-effects model to account for the fact that participants did not come from a single underlying population. However, the studies in this review represented many heterogeneous interventions, and no meta-analysis was possible.

Sensitivity analysis

We had planned to conduct sensitivity analyses to assess the impact of studies at high risk of bias compared with those at low or unclear risk of bias.

Grading of evidence and 'Summary of findings' tables

We assessed the overall certainty of the evidence for the following primary outcomes using the GRADE system: relapse, frequency of use, amount of use, any adverse events and dropout from treatment. The GRADE Working Group developed a system for grading the certainty of evidence (Schunemann 2013), which takes into account issues not only related to internal validity but also to external validity, such as directness of results.

We have presented the main findings of the review in 11 'Summary of findings' tables. This is a transparent and simple tabular form that provides key information concerning the certainty of evidence,

the magnitude of effect of the interventions examined and the sum of available data on the main outcomes.

The GRADE system uses the following criteria for assigning grades of evidence.

- High certainty: we are very confident that the true effect lies close to that of the estimate of the effect.
- Moderate certainty: we are moderately confident in the effect estimate; the true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.
- Low certainty: our confidence in the effect estimate is limited; the true effect may be substantially different from the estimate of the effect.
- Very low certainty: we have very little confidence in the effect estimate; the true effect is likely to be substantially different from the estimate of effect.

Grading is decreased for the following reasons.

- Serious (-1) or very serious (-2) study limitations for risk of bias.
- Serious (-1) or very serious (-2) inconsistency between study results.
- Some (-1) or major (-2) uncertainty about directness (the correspondence between the population, the intervention, or the outcomes measured in the studies actually found and those under consideration in our systematic review).
- Serious (-1) or very serious (-2) imprecision of the pooled estimate.
- Publication bias strongly suspected (-1).

RESULTS

Description of studies

Results of the search

As shown in Figure 1, our updated searches identified 9653 records. We screened out 9410 references based on the titles and abstracts. We examined the remaining 243 records in full-text, and excluded 239. We included four new trials (Gordan 2017; Gilbert 2015; Needles 2005; Nyamathi 2017), and one follow-up study to an existing trial within the review (Lanza 2014), along with nine studies from the previous review; the total number of studies was 13 (see Characteristics of included studies).

Included studies

Population

The 13 trials (described in 15 publications) were published between 1996 and 2017 and included 2560 participants. The 13 studies included adult drug-using women offenders. One study investigated the impact of a therapeutic community programme with adults and young offenders (Nielsen 1996). Three studies also included male offenders (Gordan 2017; Johnson 2011; Nielsen 1996), but results for the women were reported separately, enabling us to extract data specifically for this review. The mean age of the study participants ranged from 31.8 years to 39.08 years. In all but three studies, the participants were of white ethnic origin (Gilbert 2015; Nielsen 1996; Nyamathi 2017).

Settings

We categorised the studies by setting, with six community-based studies (Cropsey 2011; Gilbert 2015; Guydish 2011; Johnson 2011; Needles 2005; Nyamathi 2017), and seven secure-based studies (Gordan 2017; Johnson 2012; Lanza 2014; Messina 2010; Nielsen 1996; Sacks 2008; Zlotnick 2009). Twelve studies were set in the USA and one study was conducted in Spain (Lanza 2014).

Duration of trials

The trial duration varied between three (Cropsey 2011; Gilbert 2015; Johnson 2012; Zlotnick 2009) and 18 months (Nielsen 1996). The remaining studies reported outcomes between six and 12 months (Lanza 2014; Gordan 2017; Guydish 2011; Johnson 2011; Messina 2010; Needles 2005; Nyamathi 2017; Sacks 2008).

Outcome measures

Five out of 13 (38%) trials reported drug outcomes and 7/13 (53%) trials reported both drug and crime outcomes; no studies reported only crime outcomes.

Interventions

Collaborative-based case management

Two studies evaluated community-based case management compared to treatment as usual (standard probation and standard parole supervision) (Guydish 2011; Johnson 2011), respectively.

Pharmacological intervention

Two studies used a pharmacological intervention in comparison to a placebo (Cropsey 2011), and in comparison to post-release from prison (Gordan 2017).

Interpersonal psychotherapy

One study compared interpersonal psychotherapy to a psychoeducational comparison group (Johnson 2012).

Acceptance and commitment therapy (ACT)

One study compared ACT to a waiting list control (Lanza 2014).

Cognitive behavioural therapy

Three studies evaluate: i) a cognitive behavioural programme versus a therapeutic community programme and aftercare (Sacks 2008), treatment as usual (Zlotnick 2009), and in comparison to a substance abuse treatment (Messina 2010).

Computer-assisted intervention

One study evaluated the use of a single computer-assisted session for intimate partner violence compared to a single session delivered by a case manager (Gilbert 2015).

Dialectic behaviour therapy

One study compared dialectic behaviour therapy and case management versus a health promotion initiative (Nyamathi 2017).

Therapeutic interventions and aftercare

One study compared a therapeutic intervention versus work release Nielsen 1996.

Intensive discharge planning

One study evaluated the use of intensive discharge planning and community services for people leaving prison compared to less intensive planning and no community services (Needles 2005).

Excluded studies

We excluded 239 full-text studies (see Characteristics of excluded studies for further details). Reasons for exclusion were: not reporting relevant drug or crime outcome measures, or both, in both the pre- and post-intervention periods; and allocation of participants to study groups that were not strictly randomised or did not contain original trial data. We excluded studies because the study population did not include female participants, or they were not offenders, or the studies did not report the data for the female participants separately.

Risk of bias in included studies

See Figure 2 and Figure 3.

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

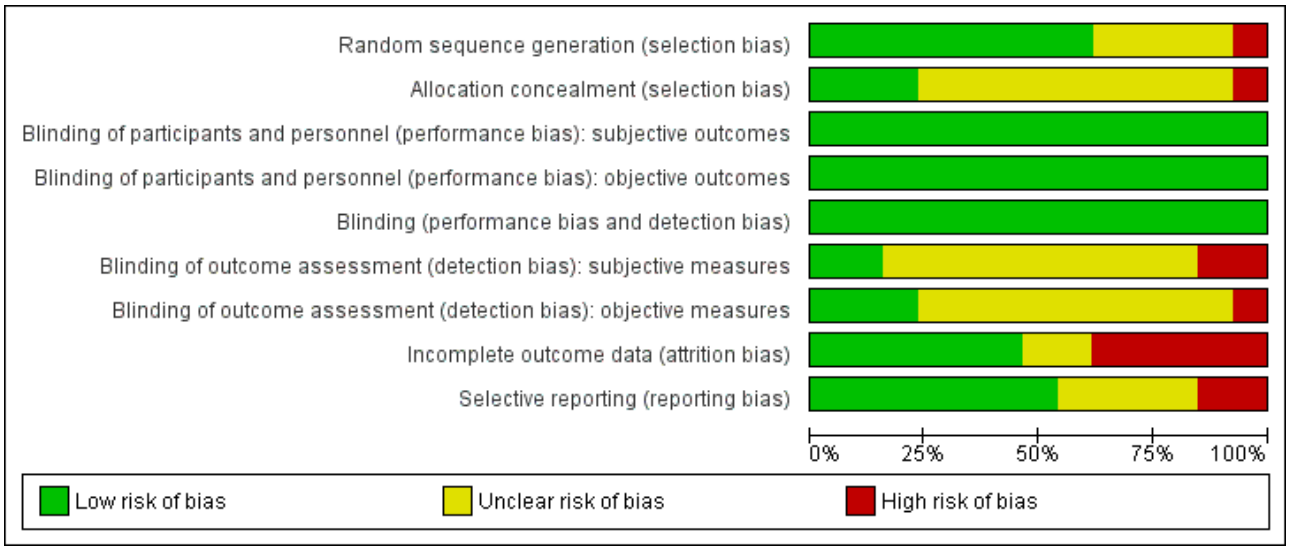


Figure 3. Risk of bias summary: review authors' judgements about each risk of bias item for each included study.

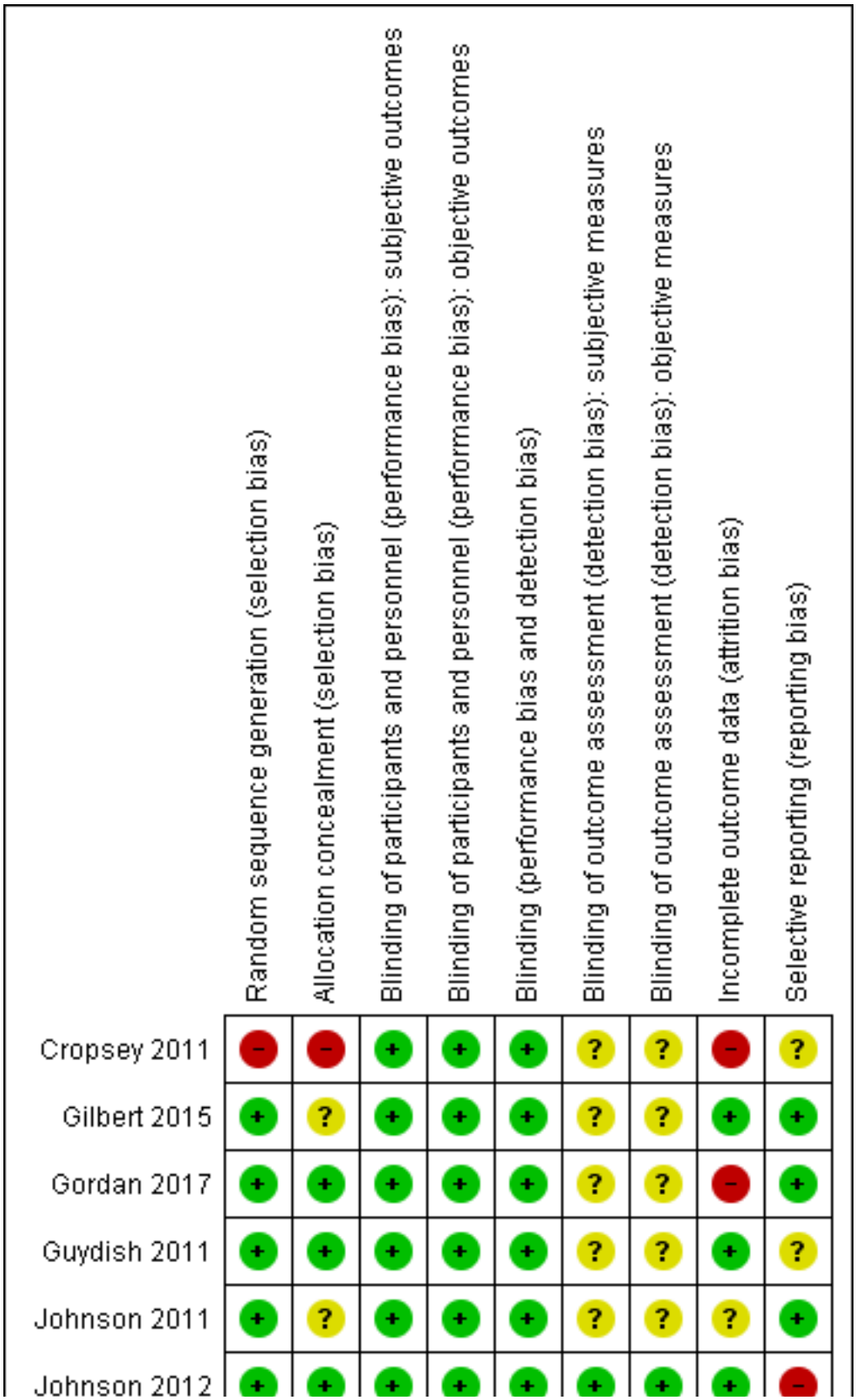
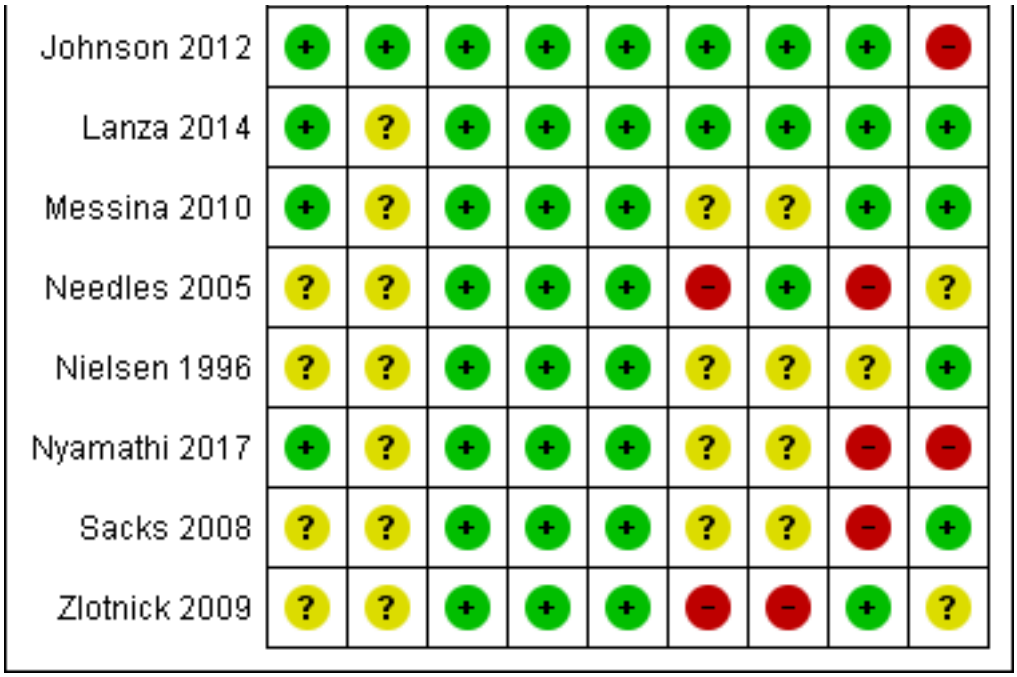


Figure 3. (Continued)



Allocation

Randomisation

All 13 studies were described as randomised. A number of different methods were used to perform the random assignment. These included use of a random number table (sometimes computerised) (Cropsey 2011; Gordan 2017; Gilbert 2015; Lanza 2014), urn randomisation (Johnson 2011; Nyamathi 2017), the use of odd and even identification numbers (Guydish 2011; Messina 2010), and wave randomisation (Johnson 2012). The description of the randomisation methodology remained unclear in the case of four studies (Needles 2005; Nielsen 1996; Sacks 2008; Zlotnick 2009).

Characteristics at baseline

All studies except Nielsen 1996 and Needles 2005 reported on similar drug use and criminal behaviour at baseline.

Allocation concealment

For allocation concealment, two studies noted use of sealed envelopes (Gordan 2017; Guydish 2011), and one study noted concealment from personnel within the study (Johnson 2012), one deliberately allocated the first nine participants to intervention for practical reasons but used sealed envelopes for the remaining sample; we rated this at high risk of bias (Cropsey 2011). In the remaining nine studies, no information was reported about allocation concealment and we therefore rated them at unclear risk of bias (Gilbert 2015; Johnson 2011; Lanza 2014; Messina 2010; Needles 2005; Nielsen 1996; Nyamathi 2017; Sacks 2008; Zlotnick 2009).

Blinding

We rated performance bias in two pharmacological studies as unclear and low risk for subjective and objective measures (Cropsey 2011; Gordan 2017); we rated all other psychosocial intervention studies as low risk. We assessed risk of detection bias for all studies across subjective and objective measures (see Appendix 12). We rated 9/13 studies as unclear (Cropsey 2011; Gordan 2017; Gilbert 2015; Guydish 2011; Johnson 2011; Messina 2010; Nielsen 1996; Nyamathi 2017; Sacks 2008). We rated two studies at low risk (Johnson 2012; Lanza 2014), and two studies at high risk of bias (Needles 2005; Zlotnick 2009).

Incomplete outcome data

Loss to follow-up was reported in eight of the 13 studies (Cropsey 2011; Gilbert 2015; Guydish 2011; Johnson 2011; Johnson 2012; Lanza 2014; Needles 2005; Nyamathi 2017). Six studies reported adequately on loss to follow-up with minimal attrition noted (Gilbert 2015; Guydish 2011; Johnson 2012; Lanza 2014; Messina 2010; Zlotnick 2009). We rated five studies at high risk of bias (Cropsey 2011; Gordan 2017 Needles 2005; Nyamathi 2017; Sacks 2008), and in two studies the reporting was unclear (Johnson 2011; Nielsen 1996).

Selective reporting

We rated four studies as being at unclear risk of reporting bias (Cropsey 2011; Guydish 2011; Needles 2005; Zlotnick 2009), two studies at high risk of selective reporting (Johnson 2012; Nyamathi 2017), and seven studies at low risk of bias (Gilbert 2015; Gordan 2017; Johnson 2011; Lanza 2014; Messina 2010; Nielsen 1996; Sacks 2008).

Effects of interventions

See: **Summary of findings for the main comparison** Collaborative case management compared to treatment as usual; **Summary of findings 2** Community-based buprenorphine compared to placebo; **Summary of findings 3** Interpersonal psychotherapy compared to psychoeducational control; **Summary of findings 4** Acceptance and commitment therapy (ACT) compared to waiting list control; **Summary of findings 5** Cognitive behavioural

therapy and other therapies compared to prison therapeutic community; **Summary of findings 6** Cognitive behavioural therapy and standard therapy compared to treatment as usual; **Summary of findings 7** Single computerised session compared to single session of case management; **Summary of findings 8** Dialectic behaviour therapy with case management compared to a health promotion scheme; **Summary of findings 9** Therapeutic community compared to work release; **Summary of findings 10** Intensive discharge planning and case management compared to prison only; **Summary of findings 11** Pre- versus post-release buprenorphine use

1. Collaborative case management versus treatment as usual

Impact on self-reported drug use

See Summary of findings for the main comparison.

Johnson 2011 showed no significant reduction in self-reported drug use at nine months follow-up (risk ratio (RR) 0.65, 95% confidence interval (CI) 0.20 to 2.12; 77 participants; low-certainty evidence; Analysis 1.1).

Impact on self-reported criminal activity

Johnson 2011 showed no significant reduction in reincarceration at nine months (RR 0.71, 95% CI 0.32 to 1.57; 77 participants; low-certainty evidence; Analysis 1.2).

Guydish 2011 showed no significant reduction in number of arrests (RR 1.11, 95% CI 0.83 to 1.49; 113 participants; low-certainty evidence; Analysis 1.3).

2. Community-based buprenorphine versus placebo

See Summary of findings 2.

Impact on self-reported drug use

Cropsey 2011 showed no significant reduction in self-reported drug use at end of treatment (RR 0.57, 95% CI 0.27 to 1.20; 36 participants; very low-certainty evidence; Analysis 2.1); nor at three months (RR 0.58, 95% CI 0.25 to 1.35; 36 participants; very low-certainty evidence Analysis 2.2).

Impact on self-reported criminal activity

Not reported.

3. Interpersonal psychotherapy versus a psychoeducational control

See Summary of findings 3.

Impact on self-reported drug use

Johnson 2012 reported no significant reduction in relapse to drug use at three months (RR 0.67, 95% CI 0.30 to 1.50; 38 participants; low-certainty evidence; Analysis 3.1).

Impact on self-reported criminal activity

Not reported.

4. Acceptance and commitment therapy (ACT) versus waiting list control

See Summary of findings 4.

Impact on self-reported drug use

The Lanza 2014 study reported no significant reduction in self-reported drug use at six months using the Addiction Severity Index (ASI) (mean difference (MD) -0.04, 95% CI -0.37 to 0.29; 31 participants; low-certainty evidence; Analysis 4.1) and abstinence from drug use (RR 2.89, 95% CI 0.73 to 11.43; 31 participants; low-certainty evidence; Analysis 4.2).

Impact on self-reported criminal activity

Not reported.

5. Cognitive behavioural therapy and other therapies versus prison therapeutic community

See Summary of findings 5.

Impact on self-reported drug use

Sacks 2008 showed no significant reduction in self-reported drug use at six months (RR 0.86, 95% CI 0.58 to 1.27; 314 participants; low-certainty evidence; Analysis 5.5).

Impact on self-reported criminal activity

Messina 2010 showed no significant reduction in reincarceration at 12 months (RR 0.70, 95% CI 0.43 to 1.12; 115 participants; low-certainty evidence; Analysis 5.1). Sacks 2008 showed no significant reduction in arrest at six months for any type of crime (RR 0.73, 95% CI 0.52 to 1.03; 314 participants; very low-certainty evidence; Analysis 5.2), criminal activity (RR 0.80, 95% CI 0.63 to 1.03; 314 participants; very low-certainty evidence; Analysis 5.3), or drug-related crime (RR 0.95, 95% CI 0.68 to 1.32; 314 participants; very low-certainty evidence; Analysis 5.4), and a significant reduction in subsequent arrest (not parole violations) (RR 0.43, 95% CI 0.25 to 0.77; 314 participants; very low-certainty evidence; Analysis 5.6).

6. Cognitive behavioural therapy and standard therapy versus treatment as usual

See Summary of findings 6.

Impact on self-reported drug use

Zlotnick 2009 showed no significant reduction in ASI drug score at three months (MD 0.02, 95% CI -0.05 to 0.09; 44 participants; very low-certainty evidence; Analysis 6.3), nor six months (MD -0.02, 95% CI -0.09 to 0.05; 44 participants; very low-certainty evidence; Analysis 6.4).

Impact on self-reported criminal activity

Zlotnick 2009 showed no significant reduction in incarceration at three months (RR 0.46, 95% CI 0.04 to 4.68; 44 participants; very low-certainty evidence; Analysis 6.1), nor six months (RR 0.51, 95% CI 0.20 to 1.27; 44 participants; very low-certainty evidence; Analysis 6.2).

7. Single computerised session versus single session of case management

See Summary of findings 7.

Impact on self-reported drug use

Gilbert 2015 showed no significant reduction in the number of days not using drugs at three months follow-up (MD -0.89, 95% CI -4.83 to 3.05; 171 participants; low-certainty evidence; Analysis 7.1).

Impact on self-reported criminal activity

Not reported.

8. Dialectic behavioural therapy with case management (DBT-CM) versus a health promotion scheme

See Summary of findings 8.

Impact on self-reported drug use

Nyamathi 2017 showed no significant reduction in positive drug testing at six months follow-up via urine samples (RR 0.67, 95% CI 0.43 to 1.03; 116 participants; very low-certainty evidence; Analysis 8.1), number of people not using marijuana (RR 1.23, 95% CI 0.95 to 1.59; 116 participants; very low-certainty evidence; Analysis 8.2), number of people not using crack (RR 1.00, 95% CI 0.87 to 1.14; 116 participants; very low-certainty evidence; Analysis 8.3), number of people not using cocaine (RR 1.02, 95% CI 0.93 to 1.12; 116 participants; very low-certainty evidence; Analysis 8.4), number of people not using heroin (RR 1.05, 95% CI 0.98 to 1.13; 116 participants; very low-certainty evidence; Analysis 8.5), number of people not using methamphetamine (RR 1.02, 95% CI 0.87 to 1.20; 116 participants; very low-certainty evidence; Analysis 8.6), self-reported drug use for any drug (RR 1.20, 95% CI 0.92 to 1.56; 116 participants; very low-certainty evidence; Analysis 8.7).

Impact on self-reported criminal activity

Not reported.

9. Therapeutic community programme versus work release

See Summary of findings 9.

Impact on self-reported drug use

Nielsen 1996 showed no significant reduction in marijuana use at six months (RR 1.03, 95% CI 0.19 to 5.65; 51 participants; very low-certainty evidence; Analysis 9.2), nor 18 months (RR 1.00, 95% CI 0.07 to 14.45; 28 participants; very low-certainty evidence; Analysis 9.3), heroin use at six months (RR 1.59, 95% CI 0.49 to 5.14; 68 participants; very low-certainty evidence; Analysis 9.4), nor 18 months (RR 1.92, 95% CI 0.24 to 15.37; 37 participants; very low-certainty evidence; Analysis 9.5), crack use at six months (RR 2.07, 95% CI 0.41 to 10.41; 55 participants; very low-certainty evidence; Analysis 9.6), nor at 18 months (RR 1.64, 95% CI 0.19 to 14.06; 34 participants; very low-certainty evidence; Analysis 9.7), cocaine use at six months (RR 1.09, 95% CI 0.79 to 1.50; 211 participants; low-certainty evidence; Analysis 9.8), nor at 18 months (RR 0.93, 95% CI 0.64 to 1.35; 139 participants; very low-certainty evidence; Analysis 9.9).

Impact on self-reported criminal activity

Nielsen 1996 showed no significant reduction in incarceration for drug offences at 18 months (RR 1.45, 95% CI 0.87 to 2.42; 112 participants; low-certainty evidence; Analysis 9.1).

10. Intensive discharge planning and case management versus prison only

See Summary of findings 10.

Impact on self-reported drug use

Needles 2005 showed no significant reduction in marijuana use (RR 0.79, 95% CI 0.53 to 1.16; 511 participants; moderate-certainty evidence; Analysis 10.1), hard drug use (RR 1.12, 95% CI 0.88 to 1.43; 511 participants; moderate-certainty evidence; Analysis 10.2), positive hair test for crack cocaine (RR 1.08, 95% CI 0.75 to 1.54; 511 participants; moderate-certainty evidence; Analysis 10.3), nor positive hair test for marijuana use (RR 0.75, 95% CI 0.55 to 1.03; 511 participants; moderate-certainty evidence; Analysis 10.4).

Impact on self-reported criminal activity

Needles 2005 showed a significant reduction in arrests (RR 0.19, 95% CI 0.04 to 0.87; 511 participants; moderate-certainty evidence; Analysis 10.5), but no significant reduction in drug charges (RR 1.07, 95% CI 0.75 to 1.53; 511 participants; moderate-certainty evidence; Analysis 10.6), nor incarceration (RR 1.09, 95% CI 0.86 to 1.39; Analysis 10.7).

11. Buprenorphine pre-release from prison versus buprenorphine post-release

Gordan 2017 reported a narrative summary of the gender differences between males and females in how they responded to the intervention. Authors contacted for further information, but did not reply. In the paper they report that no significant gender effects with P > 0.18.

Treatment setting

Too few studies were included in the meta-analyses to make a subgroup analysis for type of setting meaningful.

DISCUSSION

Summary of main results

This review provided evidence from 13 trials involving 2560 participants. The 13 trials evaluated 11 different comparisons. The certainty of the evidence was generally low to very low; we rated one study as moderate-certainty evidence. Most interventions were delivered in prison-based settings (7/13 studies, 53%) or the community (6/13 studies, 47%). Most studies compared an intervention to another intervention (8/13, 61%).

The 11 different treatment comparisons were as follows.

- Collaborative case management compared to treatment as usual (Guydish 2011; Johnson 2011).

Evaluations of case management and standard parole showed disappointing results. The Guydish 2011 probation case management study found no differential effect. Women in both groups were equally likely to be arrested during the one-year follow-up period. The study authors note that although the results indicated no advantage for probation case management over standard probation, this finding is similar to other research showing mixed effects (e.g. Sorenson 2003). The authors note that one key limitation of the probation case management was the low-level, face-to-face contact. Although probation case management

is designed to be more engaging than standard probation, only 54% of the probation case management participants reported face-to-face contact with their manager in the six months after programme entry. The implications suggest that case management based on reduced caseloads, specialised probation officer training and efforts to increase contact between probation officer and probationer may not be effective. Similarily, the study conducted by Needles and colleagues concluded that while well executed case management programmes can make a difference in the short-term outcomes for former inmates, their programme did not change the life course or basic health status of most of those involved; a change in such outcomes would be needed to indicate greater success in community integration or improved health (Needles 2005).

Use of collaborative behavioural management techniques in comparison to standard parole did not significantly reduce reincarceration (21% of the collaborative behavioural management participants versus 29% of the control participants) in the nine-month follow-up (Johnson 2011). The study did show a reduction in monthly primary drug use. This is consistent with past findings which have indicated that women who engage in prison substance use treatment programmes have lower drug use rates than men in the months after release from prison (Pelissier 2003). Other researchers have highlighted this gender effect, suggesting that factors predicting aftercare treatment completion, post-treatment drug use and recidivism were slightly different for women than for men, suggesting the possibility of gender-specific pathways to successful community re-entry (Pelissier 2003). This finding is important because it may support the idea that optimal transitional treatments may differ for men and women, however more randomised trials of transitional interventions for drug-involved offenders are required (Taxman 2002). The authors suggest that any gender differences displayed between men and women should be revisited to assess what important lessons can be applied for the successful integration of theory- and gender-responsive treatment. Some successful elements of treatment seemed to include a recognition of success, an emphasis on consistency and fairness from within the programme, and a focus on overall life functioning and support (Johnson 2011).

- Community-based buprenorphine compared to a placebo (Cropsey 2011), and in comparison to pre- and post-release from prison (Gordan 2017).

Pharmacological interventions using buprenorphine for opioid-dependent women with a HIV risk found that use of buprenorphine in prison and continued use of the drug in the community was not beneficial in preventing or delaying relapse to opioid use (Cropsey 2011). The findings were not sustained post-treatment, with most women relapsing to active opioid use at the three-month follow-up point. The study did not measure criminal activity, so we do not know whether such interventions are likely to reduce subsequent criminal activity in the future. Pre- and post-release use of buprenorphine was compared in another study showing no beneficial effect of gender on any outcome measures at 12 months post-release from prison (Gordan 2017).

- Interpersonal psychotherapy compared to a psychoeducational control (Johnson 2012).

Interpersonal psychotherapy was evaluated using a pilot study with women suffering from major depression and substance use disorder (Johnson 2012). This study is primarily a feasibility study to assess the applicability of using interpersonal psychotherapy in a prison environment. Despite being small, it is one of the largest trials including women with co-occurring substance misuse and mental health problems. The findings showed that interpersonal psychotherapy participants did not significantly reduce levels of substance misuse over the attention matched control. The study authors note that the intensity of treatment delivered, once released into the community, is key to maintaining good outcomes. However, they go on to state that women often experience delays in treatment and service provision on release and they suggest that alternative service provision such as phone treatment might be helpful in providing a more intensive post-release treatment, and may form a useful contact in times of crisis.

- Acceptance and commitment therapy (ACT) compared to a waiting list control (Lanza 2014).

The study evaluating ACT and a control group found no difference between the two groups (Lanza 2014). The authors note the ACT applies the 'co-joint' work between the therapist and client. The aim of which is to increase the flexibility and structure of the therapy, allowing the client to have greater autonomy over making decisions (Lanza 2014).

- Cognitive behavioural therapy and other therapies compared to a prison-based therapeutic community programme (Sacks 2008), and compared to treatment as usual (Messina 2010), and a substance abuse treatment programme (Zlotnick 2009).

The specifically adapted gender-responsive therapeutic community programme for women offenders was evaluated by Sacks and colleagues. This study compared women assigned to the therapeutic community programme or standard treatment (referred to in the system as the Intensive Outpatient Programme), or cognitive behavioural therapy. This consisted of a cognitive behavioural recovery and relapse prevention curriculum (Sacks 2008). At six months the study found that there was one significant difference between the groups for arrested (not parole violation). They note that further exploration of each model for different offender groups is required to permit a more precise utility of each model. The study authors conclude that these preliminary findings suggest the importance of providing gender-specific sensitive and comprehensive approaches within the correctional system to respond to the complex substance abuse needs of female offenders (Sacks 2008). The more recent follow-up study investigated outcomes at six months and 12 months. The outcomes followed a similar pattern with both groups of women benefiting from treatment. The therapeutic community programme was found to be more beneficial than cognitive behavioural therapy at improving reincarceration rates and lengthening the amount of time spent in the community before subsequent reincarceration (Sacks 2012).

The Messina 2010 study showed that gender-responsive treatment participants voluntarily remain in aftercare treatment for longer periods and are less likely than those in standard therapeutic community care to be reincarcerated within 12 months of parole. One of the main differences between gender-responsive treatment and therapeutic community programmes was the recognition of trauma. The authors argue that trauma seemed to impact on a range of other outcomes and was an important aspect of recovery which needed to be addressed. The possible reason for this benefit may be due to the overall enhanced treatment satisfaction of

participants compared with those in the standard treatment group. This finding is supported by other qualitative research which showed that women attending the gender-responsive treatment programme were extremely invested and satisfied with treatment outcomes, and felt supported by other group members, which may have increased treatment adherence and recovery (Calhoun 2009; Messina 2010). Additionally, the authors noted that those women who stayed in treatment voluntarily remained in aftercare for a longer period of time. A number of implementation barriers were presented in the study, including the need for ongoing staff training, technical assistance and monitoring of adherence to the study protocol.

The final study evaluated in this group of analyses compared the use of a cognitive skills and cognitive behavioural therapy, referred to as the Seeking Safety Programme. The study compared seeking safety to standard prison-based substance abuse treatment, and found no significant differences between conditions on any measure in the primary analysis (Zlotnick 2009). This finding is contrary to other research conducted using the Seeking Safety Programme with non-correctional clients in the community (Najavits 2006). The authors note that future research should focus specifically on whether dosage has an impact on the successful outcome of seeking safety, with participants randomly assigned to different lengths of treatment. Further difficulties in the evaluation of the study led to concerns about adherence to the programme once the women were released into the community. A series of 12 booster sessions were offered, but on average women only attended three sessions. The challenge of programme adherence is common across the criminal justice system, especially with those programmes conducted in the community. Given this context, the authors suggest that perhaps longer treatment during prison and increased frequency of treatment following release may be helpful. A major question for future research relates to the development of models for dealing with simultaneous problems and concurrent mental health issues (Zlotnick 2009).

- A computerised intervention compared to a single session of case management (Gilbert 2015).

The study of a single computerised session in comparison to a single session delivered by a case manager showed no significant differences (Gilbert 2015). The authors note that further research should consider whether the costs of implementing the computerised intervention might increase the likelihood of it being scaled up for use in community supervision sessions. Future research in this area, therefore needs to incorporate cost-effectiveness information and longer-term follow-ups to support the evidence of the efficacy of any such programme (Gilbert 2015).

- Dialectic behavioural therapy (DBT) with case management compared to a health promotion scheme (Nyamathi 2017).

Combining case management with DBT showed no significant differences compared to the health promotion scheme in a group of women under supervision in the probation and parole systems (Nyamathi 2017). The study failed to describe the detailed components regarding the amount of DBT-CM (dialectic behavioural therapy with case management) received, so it is difficult to ascertain whether the impact of these findings is due to the combination of effects or one single component(s) of the intervention.

- Therapuetic community programme compared to work release (Nielsen 1996).

In these studies the Continual Recovery through Education and Skills Training (CREST) work release programme was compared to participants in the Delaware conventional work release programme. The evaluation showed that it is possible to successfully combine the elements of therapeutic community treatment with the goals of work release (Nielsen 1996).

- Intensive discharge planning and case management in comparison to prison only (Needles 2005).

This study did observe reductions in rearrest rates. The authors concluded that a well-executed case management programme can make modest differences in a few short-term outcomes of former inmates. However, the intervention did not lead to the hoped for changes across a range of outcomes that would clearly indicate greater success in community reintegration or improved health (Needles 2005).

Overall completeness and applicability of evidence

The paucity of evidence within the review is covered in three key areas.

General applicability

The applicability of this evidence is hindered in general by the number of small trials representing a range of different treatment options for female offenders with drug misuse problems. All trials, apart from one, were conducted in the USA and therefore, they have limited external validity to other criminal justice systems outside of the USA.

Adaptation of programmes for female offenders

Most of the studies described the programmes under evaluation as 'adapted' or 'amended' programmes tailored to the needs of women, but few studies described how the programmes had been adapted or what considerations had been taken into account. It is therefore difficult to draw conclusions about the successful elements of treatment programmes for female offenders.

Certainty of evidence

We rated the majority of studies as being at 'unclear' risk of bias with poor reporting of information by study authors, making it difficult for the authors of this review to assess the extent of potential bias within the studies. Since poor reporting lowers the certainty of evidence, in all but one study we judged the evidence to be of very low to low certainty, which means that further research is very likely to have an important impact on our confidence in the estimate of effect (imprecision of the estimate) and is likely to change the estimate based on the small sample sizes of the existing trials. Additional concerns with the research included attrition bias, and the limited external generalisation associated with such studies and contamination effects.

A number of studies posed a threat to attrition bias, with over 50% rated at high risk of attrition. Five of the nine studies were classified as pilot studies, using sample sizes of 55 or less. The Cropsey 2011 study identified a sample of 36 women, randomly allocating 27 (15 to the intervention and 12 to the placebo group). They note that although the potency of buprenorphine for control of opioid use

is clearly demonstrated, a larger sample size may be needed to detect significant differences between groups on other variables of interest. The study was limited to three months of treatment, and future studies should explore the provision of buprenorphine for longer periods of time, to prolong opioid abstinence and to prevent associated criminal activity.

The Zlotnick 2009 study used a slightly larger sample of 55 women with post-traumatic stress disorder in an incarcerated setting, comparing cognitive behavioural therapy plus treatment as usual to treatment as usual alone. The Messina 2010 study called for larger sample sizes and bigger experimental studies. Similarly, the Lanza 2014 study assigned only 50 participants with complex needs; they note that future research should include larger samples. The Johnson 2012 study assigned 19 participants to each arm of the trial and also had difficulties in measuring relapse rates, as 26% of the sample remained in residential treatment for the entire follow-up period.

Other potential biases were presented in the Zlotnick 2009 study, which noted potential contamination problems between the treatment and control conditions across the prison setting. Offenders from different wings or locations within the prison frequently mixed or moved locations. Finally, they noted that the facilitators delivered both the treatment intervention and treatment as usual, and that an immediate post-assessment was not completed. The authors argue this could have had an unknown effect on the immediate impact of the intervention.

Potential biases in the review process

Besides the limitations already discussed, the search methodology was limited to databases that could be accessed via the University of York and extensive website searches were not conducted. As a result, some literature may have been missed from this updated version.

AUTHORS' CONCLUSIONS

Implications for practice

The current evidence suggests that there is little evidence to support the use of any of the described interventions with women offenders with drug use problems and as such we do not know how and what treatments facilitate the rehabilitation of female offenders. Overall, the studies showed a high degree of heterogeneity for types of comparisons and outcome measures assessed, which limited the possibility to pool the data. Only one significant outcome for arrest (not parole violations) was identified for a cognitive behavioural therapy in comparison to a therapeutic community programme. None of the other interventions seemed to be effective and additionally, some of the sample sizes were very small. Larger trials (although difficult to achieve in this population) are required to increase the precision of confidence about the certainty of evidence on the impact of treatments for female drug-using offenders. Descriptions of treatment modalities are required to identify the important elements for treatment success in drug-using female offenders.

Implications for research

Specific questions in the research literature identify a number of different gaps in current research.

- Future work should consider the most appropriate use of outcomes and produce some standardisation from which comparisons can be made across the literature.
- Researchers should also explore the needs and experiences of women (e.g. child care restrictions, previous trauma). Qualitative research into the experiences of women attending, or starting and not finishing programmes, could help researchers to learn important lessons in the design of interventions that are appropriate for this population.
- Larger-scale trial evaluations need to include information about the exact nature of the programme, the content, intensity, delivery and administration. Specific information about how programmes are adapted or amended for women will provide important theoretical gender differences for future treatment programmes targeting female offenders.
- Longer-term follow-up outcomes are required to evaluate the ongoing impact of interventions which might reduce drug use and criminal activity in female offenders.
- More studies are required to consider the transitional links between court, prison and release from prison in the community.
- Randomised controlled trials (RCTs) should be encouraged by policy makers and supported by funding bodies outside of the USA to generate an evidence base that will have greater generalisability and replication to other criminal justice systems worldwide.

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* Indicates the major publication for the study

CHARACTERISTICS OF STUDIES

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

Cropsey 2011

Methods	Study design: RCT Study grouping: parallel group
Participants	• 36 adults • Mean age 31.8 (SD 8.4) • 100% female • 89% white • 100 drug users • Alcohol use: yes – percentage not available • 54.3% prescribed medication for mental illness **Eligibility criteria:** adult women, opioid dependent, interest in treatment for opioid dependence, no contraindications for buprenorphine, due for release from residential treatment within month, returning to the community, release into the immediate residential area
Interventions	Community-based pharmacological intervention versus placebo **Experimental intervention** The group was started on 2 mg of buprenorphine, increased to target dose of 8 mg at discharge. Only 37.2% reached target dose at discharge. (Doses were lower than standard induction as participants had been in a controlled environment for some time without access to opiates). Doses were then titrated up to a maximum of 32 mg per day in the community, as clinically indicated. Participants were assessed weekly for side effects, given drug testing, and counselled by study physician if using drugs (n = 15).

Cropsey 2011 *(Continued)*

	Setting: prison into the community Length of treatment: 12 weeks Length of follow-up: 3 months **Control** The control group was given a placebo on the same regimen as the intervention group. The placebo was dispensed by the pharmacy in identical pill bottles, and given to the participants by the study staff during the weekly evaluations. Participants were evaluated weekly by the study physician and given the placebo on a weekly basis (n = 12). **Setting**: prison into the community Length of treatment:12 weeks Length of follow-up: 3 months
Outcomes	% injection drug use and % urine opiates at end of treatment and 3 months follow-up
Notes	**Funding:** This project was supported by funding from NIDA R21DA019838 and product support from Reckitt Benckiser Pharmaceuticals Inc. The views expressed in this paper are solely the responsibility of the authors and do not necessarily reflect the views of NIH or NIDA. **Conflict of interest:** no declaration of interest reported by the authors **Country:** USA **Adverse effects:** not reported

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	The first nine participants were deliberately allocated to the intervention for practical reasons. Subsequently a random number table was used to allocate the remaining sample to the intervention or placebo.
Allocation concealment (selection bias)	High risk	The first nine participants were deliberately allocated to the intervention for practical reasons. Use of sealed envelopes for the remaining sample
Blinding of participants and personnel (performance bias) subjective outcomes	Low risk	Participants and personnel were blind to all outcome measures
Blinding of participants and personnel (performance bias) objective outcomes	Low risk	Participants and personnel were blind to all outcome measures
Blinding (performance bias and detection bias) All outcomes	Low risk	Participants and personnel were blind to all outcome measures
Blinding of outcome assessment (detection bias) subjective measures	Unclear risk	No evidence to provide information about whether the assessors who conducted the outcome assessments were blind

Cropsey 2011 *(Continued)*

Blinding of outcome assessment (detection bias) objective measures	Unclear risk	No evidence to provide information about whether the assessors who conducted the outcome assessments were blind
Incomplete outcome data (attrition bias) All outcomes	High risk	A total of eight individuals (22%) were not included in the final analysis after randomisation. It is unclear whether an ITT analysis was conducted.
Selective reporting (reporting bias)	Unclear risk	No protocol identified.

Gilbert 2015

Methods	Study design: RCT Study grouping: Parallel group
Participants	• 191 adults • Mean age 34.2 (SD 11.4) • 100% female • 67% black • 51% reported use of any illicit drug use in the past 30 days • 42% reported binge drinking **Eligibility criteria:** 1) being aged 18 or older, (2) having a mailing address, (3) reporting illicit drug use, binge drinking or receiving drug treatment in the past six months and (4) reporting an intimate relationship with a male and/or female partner in the past year.
Interventions	Single session computerised intervention for intimate partner violence versus single session case manager delivered intervention for intimate partner violence. **Experimental intervention** Single session computerised intervention containing psychosocial education, enhancing motivation, screening for IPV and risk assessment, safety planning, enhancing social support, goal setting and identification of service needs. The average length of the session was 44.63 minutes for the single computerised intervention. Sesssion adherence was confirmed with 99% of participants attending and completing all activities within the intervention (n = 94). **Setting**: community Length of treatment: 45 minutes Length of follow-up: 3 months **Control** Single session of case manager delivered intervention for intimate partner violence (n = 97) **Setting**: community Length of treatment:45 minutes Length of follow-up: 3 months
Outcomes	Number of days not using drugs (in the past 30 days)
Notes	**Funding:** This study was supported by the National Institute on Drug Abuse (NIDA), grant no. R34DA031325.

Gilbert 2015 *(Continued)*

Conflict of interest: NIDA staff had no further role in study design, data collection, data analysis and interpretation, manuscript preparation or the decision to submit the manuscript for publication

Country: USA

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	The computer-generated randomisation algorithm was designed to balance the number of women per arm and site.
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of participants and personnel (performance bias) subjective outcomes	Low risk	Being aware of receiving a psychosocial treatment is part of the therapeutic effect
Blinding of participants and personnel (performance bias) objective outcomes	Low risk	Being aware of receiving a psychosocial treatment is part of the therapeutic effect
Blinding (performance bias and detection bias) All outcomes	Low risk	Being aware of receiving a psychosocial treatment is part of the therapeutic effect
Blinding of outcome assessment (detection bias) subjective measures	Unclear risk	Not reported
Blinding of outcome assessment (detection bias) objective measures	Unclear risk	Not reported
Incomplete outcome data (attrition bias) All outcomes	Low risk	Multiple imputation was used to handle missing data because of loss to follow-up. Ten imputed data sets were generated. Multiple imputation uses a participant's measured information to predict values of variables for which of that individual's information is missing.
Selective reporting (reporting bias)	Low risk	Primary and secondary outcomes clearly stated and reported

Gordan 2017

Methods	Study design: RCT Study grouping: Parallel group
Participants	• 211 adults • 39.08 mean age • 30% female • % black not reported • % reported use of any illicit drug use in the past 30 days not reported

Gordan 2017 *(Continued)*

- % reported binge drinking not reported

Eligibility criteria: in order to be eligible for study participation, consenting prisoners had to: be at least 18 years of age; be within 3–9 months prior to scheduled release; have met DSM-IV criteria for opioid dependence in the year prior to incarceration; be considered by the study physician to be medically suitable for buprenorphine; and plan to live in Baltimore after release.

Interventions	Buprenorphine prior to release from prison versus buprenorphine following release into the community **Experimental intervention** All participants were expected to complete an individual counselling assessment and to attend 12 weekly sessions of group-based substance abuse counselling prior to release. Just prior to discharge, an individual discharge planning session with the study counsellor was also available. In addition, participants were expected to attend 12 weekly group-based substance abuse counselling sessions that were largely psychoeducational in nature. Buprenorphine treatment in prison was provided by the medical and nursing staff from a community-based programme. Daily dosing of buprenorphine/naloxone was directly administered by nursing staff with a goal of starting at 1 mg daily and increasing slowly (initially by 1 mg per week until reaching 4 mg per day, and subsequently by 2 mg per week until reaching 8 mg). (n = 106) **Setting**: in prison Length of treatment: 12 weeks Length of follow-up: 12 months **Control** As above but buprenorphine was not given until post-release in the community (n = 105). **Setting**: post-release in the community Length of treatment: 12 weeks Length of follow-up: 12 months
Outcomes	Heroin use (in the past 30 days) Urine testing (proportion positive)
Notes	**Funding:** This study was supported by the National Institute on Drug Abuse (NIDA), Buprenorphine for Prisoners (PI: Kinlock; R01DA021579). **Conflict of interest:** This study was supported by an unrestricted, unsolicited investigator initiated request from Reckitt Benckiser Pharmaceuticals, Inc. (provided study drug only) who had no role in study design; collection, analysis and interpretation of data; in the writing of the manuscript; or in the decision to submit the manuscript for publication. The authors alone are responsible for the content and writing of this manuscript. Drs Gordon, Kinlock, and Fitzgerald received funding from Alkermes on a prior study. Dr Schwartz did a one-time consultation for Reckitt-Benckiser on behalf of his employer (the Friends Research Institute). Dr O'Grady has in the past received funding for his time from Reckitt-Benckiser. Dr Vocci has consulted with and received other funding (meals, travel expenses) from the following companies: Braeburn Pharmaceuticals, Demerx, Indivior, Pinney Associates. He has received travel and meal expenses from Intratab Labs Inc, and received consulting fees from Alkermes and Usona Institute. All of Dr Vocci's consulting fees go to his employer, Friends Research Institute, Inc. **Country:** USA

Risk of bias

Bias	Authors' judgement	Support for judgement

Gordan 2017 *(Continued)*

Random sequence generation (selection bias)	Low risk	Sequence was generated by computer
Allocation concealment (selection bias)	Low risk	The research assistant opened a sealed, opaque envelope that was numbered by the project manager following a sequence that was generated by a random permutation computer programme.
Blinding of participants and personnel (performance bias) subjective outcomes	Low risk	Being aware of receiving a psychosocial treatment is part of the therapeutic effect
Blinding of participants and personnel (performance bias) objective outcomes	Low risk	Being aware of receiving a psychosocial treatment is part of the therapeutic effect
Blinding (performance bias and detection bias) All outcomes	Low risk	Being aware of receiving a psychosocial treatment is part of the therapeutic effect
Blinding of outcome assessment (detection bias) subjective measures	Unclear risk	Not reported
Blinding of outcome assessment (detection bias) objective measures	Unclear risk	Not reported
Incomplete outcome data (attrition bias) All outcomes	High risk	We were only able to obtain urine samples on 64% of the 211 participants, mainly due to reincarceration, or to an interview conducted by Timeline Followback after its due date. While treatment retention data were obtained for nearly the entire sample (through examination of the programme records), because an increasing number of participants were not available for interview during incarceration, the self-reported findings may have been influenced by differential attrition across the follow-up times.
Selective reporting (reporting bias)	Low risk	The study protocol is available and all of the study's prespecified (primary and secondary) outcomes that are of interest in the review have been reported in the prespecified way.

Guydish 2011

Methods	Study design: RCT Study grouping: Parallel group
Participants	• 188 adults • Mean age 34.7 (SD 9.2) • 100% female • 57.4% African-American • Addiction Severity Index: 50.5 (intervention) 51.6 (control) • Alcohol use: 7.7% intervention, 5.6% control • Beck Depression Inventory mean: 14.6 (intervention) 14.6 (control)

Guydish 2011 *(Continued)*

	Eligibility criteria: willing to enter substance use treatment, residents of San Francisco, 18 years of age or older, substance use, involved in the criminal justice system. Excluded if multiple violent episodes, current involvement in drug court, court order to receive probation case management services, or referral by probation officer directly to the probation case management programme
Interventions	Community case management intervention versus treatment as usual **Experimental intervention** Probation case management, client contact at least twice per month. Officers would attend treatment planning meetings, make home visits, and accompany the client to important meetings. Could also refer client to other appropriate agencies. Included therapeutic and advocacy orientation and counselling (n = 92). **Setting**: community Length of treatment: not reported length of follow-up: 6 and 12 months **Control** Treatment as usual was standard probation services including preparation of reports for court, supervision of offender, enforcement of probation conditions, assistance to offender in accessing necessary services (n = 96) **Setting**: community Length of treatment: not reported length of follow-up: 6 and 12 months
Outcomes	• Percentage participants arrested and mean time to first arrest (from administrative data) during 12 month follow-up period • Addiction Severity Index composite scores, reported as relative risk, at 6 months and 12 months • Beck Depression Inventory • Brief Symptom Inventory • Service utilisation
Notes	**Funding:** This study was supported by the Center for Substance Abuse Treatment (1UD8TI11215), by the National Institute on Drug Abuse (NIDA) San Francisco Treatment Research Center (P50-DA09253), and by the California–Arizona node of the NIDA Clinical Trials Network (U10-DA15815). **Conflict of interest:** no declaration of interest reported by the authors **Country:** USA

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Random assignment, using even and odd numbers drawn from sealed envelopes
Allocation concealment (selection bias)	Low risk	Use of sealed envelopes containing a randomly generated number
Blinding of participants and personnel (performance bias)	Low risk	Being aware of receiving a psychosocial treatment is part of the therapeutic effect

Guydish 2011 *(Continued)*

subjective outcomes		
Blinding of participants and personnel (performance bias) objective outcomes	Low risk	Being aware of receiving a psychosocial treatment is part of the therapeutic effect
Blinding (performance bias and detection bias) All outcomes	Low risk	Being aware of receiving a psychosocial treatment is part of the therapeutic effect
Blinding of outcome assessment (detection bias) subjective measures	Unclear risk	No evidence to provide information about whether the assessors were blind
Blinding of outcome assessment (detection bias) objective measures	Unclear risk	No evidence to provide information about whether the assessors were blind
Incomplete outcome data (attrition bias) All outcomes	Low risk	Follow-up rates at each time point did not differ significantly between the groups. At 12 months 82.6% of the probation case management and 78.0% of the standard probation were followed up
Selective reporting (reporting bias)	Unclear risk	No protocol identified

Johnson 2011

Methods	Study design: RCT Study grouping: Parallel group
Participants	• 476 adults (n = 77 women) • Men mean age 34.4 years (SD 8.6); women mean age 35.6 years (SD 8.5) • 82% male • 51% black • 82% used primary drug in pre-prison 6 months • 63% men and 39% women self-reported alcohol use during pre-prison 6 months • 25% lifetime depression **Eligibility criteria:** at least 18 years of age, English speaking, probable drug dependence immediately prior to incarceration (score of 3 or more on drug screen), substance use treatment as a mandated or recommended condition of parole, moderate to high risk of drug use relapse and/or recidivism (score of 7 or more on LCSF).
Interventions	Community collaborative behavioural management intervention versus treatment as usual **Experimental intervention** Collaborative behavioural management (n = 221). 12-week intervention based on premise that reinforcement of desired behaviour is more likely to result in sustained positive change than punishment of undesired behaviour. Involves treatment sessions with offender, officer, and substance use counsellor at least once every 2 weeks, plus further officer/offender contacts. **Setting**: community Length of treatment: 12 weeks

Johnson 2011 *(Continued)*

	Length of follow-up: 9 months **Control** Treatment as usual was standard parole supervision (n = 210) including weekly to monthly face-to-face officer/client contact, and drug testing. Officers were affiliated with a substance abuse treatment programme. Average 1 to 4 contacts per month. **Setting**: community Length of treatment: 12 weeks Length of follow-up: 9 months
Outcomes	Percentage reincarcerated (self-reported) at 9-month follow-up Percentage using primary drug (self-reported) during 9-month follow-up
Notes	**Funding:** Dr Johnson is supported by K23DA021159 from NIDA. The Step'N Out study was funded as part of CJ-DATS under a cooperative agreement from NIDA and the National Institutes of Health (NIH), with support from SAMHSA's CSAT; the Centers for Disease Control and Prevention; the Centers for Disease Control and Prevention; the National Institute on Alcohol Abuse and Alcoholism (all part of the US Department of Health and Human Services); and from the Bureau of Justice Assistance of the US Department of Justice. **Conflict of interest**: no declaration of interest reported by the authors **Country:** USA

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"Subjects were randomised using urn randomisation to ensure balance of gender and other factors"
Allocation concealment (selection bias)	Unclear risk	No information was provided
Blinding of participants and personnel (performance bias) subjective outcomes	Low risk	Being aware of receiving a psychosocial treatment is part of the therapeutic effect
Blinding of participants and personnel (performance bias) objective outcomes	Low risk	Being aware of receiving a psychosocial treatment is part of the therapeutic effect
Blinding (performance bias and detection bias) All outcomes	Low risk	Being aware of receiving a psychosocial treatment is part of the therapeutic effect
Blinding of outcome assessment (detection bias) subjective measures	Unclear risk	No evidence to provide information about whether the assessors were blind
Blinding of outcome assessment (detection bias) objective measures	Unclear risk	No evidence to provide information about whether the assessors were blind

Johnson 2011 *(Continued)*

Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Some attrition and loss is reported in the sample. 476 were interviewed at baseline but it is unclear how many were randomised and the number of candidates rejected is not reported with reasons for exclusion
Selective reporting (reporting bias)	Low risk	Protocol reported and outcomes presented accordingly

Johnson 2012

Methods	Study design: RCT Study grouping: Parallel group
Participants	• 38 adults • Average age: 35 years (SD 9.2) • 100% female • 18% Hispanic, 18% African American • 58% cocaine dependence, 24% opiate dependence, 21% marijuana dependence, 21% sedative/hypnotic dependence • 58% alcohol dependence • 100 % psychiatric history Criteria used for mental health diagnoses – "MDD as determined by the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I) after at least 4 weeks of abstinence and prison substance use treatment" Description of mental health problem – MDD **Eligibility criteria:** primary MDD as determined by the Structured Clinical Interview for DSM-IV Axis I Disorders after at least 4 weeks of abstinence and prison substance use treatment, minimum 17-item Hamilton Depression Scale score of 18, substance use disorder one month prior to incarceration as determined by the SCID, 10-24 weeks away from prison release.
Interventions	Interpersonal psychotherapy versus psychoeducational control **Experimental group** Intervention participants received manualised 60-75 min group sessions three times per week for 8 weeks plus pre-group, mid-group, and post-group individual sessions in prison for the treatment of substance misuse and mental health problems. Participants in both conditions also received 6 weekly post-release individual sessions to help maintain gains and address crises as women transitioned to the community. Session lengths varied between 60 and 75 min because of time taken to assemble women within the facilities, occasional early prison counts, and other facility logistics (n = 19). **Setting:** prison **Length of treatment:** 60-75 minutes, 3 times per week for 8 weeks, plus pre-/mid- and post-group individual sessions and 6-weekly post-release individual sessions to support transition into the community. **Length of follow-up:** end of treatment at 8 weeks **Control group** Control condition participants received attention-matched manualised in-prison and post-release psychoeducation, which is described as co-occurring mental health and substance use disorders (PSYCHOED). The psychoeducation condition was adapted from a class on co-occurring disorders for pris-

Johnson 2012 *(Continued)*

	oners which had been used at the women's facilities in the past, but was not being used at the time of the study. It was designed to be credible and engaging without focusing on the theorised active ingredients of interpersonal psychotherapy (e.g. focus on social support, relationships, life changes, analysis of communication, and exploration of emotions). The stated purpose of PSYCHOED was to help women become informed and empowered consumers of mental health treatment services. The 24 in-prison sessions focused on the meaning of dual diagnosis, women's experience with dual diagnosis, major depression, bipolar disorder, each of the anxiety disorders, post-traumatic stress disorder, personality disorders, psychotic disorders, eating disorders, and self-care. Sessions for each disorder described symptoms (including relevant self-reported tests), interactions between the disorder and substance use, effects of the disorder on women in prison (including film clips and written stories), and disorder specific medication and psychosocial treatment options. When a woman in group had symptoms of a disorder, the group discussed her treatment options and preferences. The six post-release sessions focused on women's symptoms and connection with various mental health and substance use treatment options in the community. Study treatments took place in addition to prison treatment as usual. Treatment as usual consisted of prison residential or day treatment for a substance use disorder (SUD: typically 16 to 30 hrs per week) for all participants and prison mental health treatment as usual for most participants (n = 19). **Setting:** prison **Length of treatment:** 60-75 minutes, 3 times per week for 8 weeks, plus pre-/mid- and post-group individual sessions and 6 weekly post-release individual sessions to support transition into the community **Length of follow-up:** end of treatment at 8 weeks
Outcomes	Relapse within 3-month follow-up period, defined as using drugs on at least 10% of non-incarcerated days or any positive breath test/urine drug screen. HRSD scores
Notes	**Funding:** work supported by United States National Institute of Drug Abuse **Conflict of interest:** no declarations of interest are noted by the authors **Country:** USA

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Wave randomisation used with at least 8 weeks between allocation to avoid contamination across prison wings
Allocation concealment (selection bias)	Low risk	Random sequence generated by person independent of rest of study. Allocation adequately concealed from principal investigator and research assistants. An independent individual concealed the assignment of each wave before the study started. After the intake assessment was complete, the principal investigator unsealed the waves of treatment assignment.
Blinding of participants and personnel (performance bias) subjective outcomes	Low risk	Being aware of receiving a psychosocial treatment is part of the therapeutic effect
Blinding of participants and personnel (performance bias) objective outcomes	Low risk	Being aware of receiving a psychosocial treatment is part of the therapeutic effect
Blinding (performance bias and detection bias) All outcomes	Low risk	Being aware of receiving a psychosocial treatment is part of the therapeutic effect

Johnson 2012 *(Continued)*

Blinding of outcome assessment (detection bias) subjective measures	Low risk	Adequate blinding throughout study. Research assistants who conducted the follow-up assessment at 3 months after prison release were kept blind to the condition.
Blinding of outcome assessment (detection bias) objective measures	Low risk	Adequate blinding throughout study. Research assistants who conducted the follow-up assessment at 3 months after prison release were kept blind to the condition.
Incomplete outcome data (attrition bias) All outcomes	Low risk	No loss to follow-up, ITT analysis
Selective reporting (reporting bias)	High risk	Did not report on SCID-1/SCID-II, Trauma History Questionnaire or Timeline Followback.

Lanza 2014

Methods	Study design: RCT Study grouping: Parallel group
Participants	• 50 adults • Average age: overall mean 33.2 (SD 7.2) (range: 21-49) • (CBT 35.2 (mean) ACT 31.1 (mean); control 33.1 (mean)) • 100% female • Not recorded % white • % drug users: CBT 100%, ACT 83.3%, control 100% • % alcohol CBT 0%, ACT 16.7%, control 100% • % psychiatric history: 86% had at least one mental disorder **Eligibility criteria** • Met diagnostic criteria for current substance use disorder • Serving sentence of more than 6 months
Interventions	CBT versus ACT versus waiting list control **Experimental intervention one** CBT was used to change behaviour through cognitive restructuring where therapist works with offender to identify thoughts that cause distress and uses CBT to alter resulting behaviour. After treatment, offenders were assessed by the therapist, and follow-up was conducted at six months. The main outcome of the CBT intervention was to increase abstinence from drug use, this was measured and corroborated by urine analysis testing (N = 19). **Setting:** prison length of treatment: 16 weekly group sessions lasting 90 minutes each Length of follow-up**:** 6, 12, 18 months **Experimental intervention two** ACT seeks to undermine the grip of the literal verbal content of cognition that provokes avoidance behaviour and constructs an alternative context in which behaviour aligned with one's values is more likely to occur. Sessions involve both experiential and didactic learning to enable clients to experience and understand the size key ACT processes. ACT helps offenders to respond to previously avoided events in new ways and uses validation and empowerment. The ACT therapy was aimed at increas-

Lanza 2014 *(Continued)*

	ing substance use abstinence within the prison population. After treatment, offenders were assessed by the therapist, and follow-up was conducted at six months (N = 18). **Setting:** prison length of treatment: 16 weekly group sessions lasting 90 minutes each Length of follow-up**:** 6, 12, 18 months **Control** Control group received a mental health assessment at the same time as the experimental groups and were placed on a waiting list. After 6 months follow-up they received treatment. The offenders received a re-educational programme during incarceration (n = 13). **Setting:** prison length of treatment**:** 16 weekly group sessions lasting 90 minutes each Length of follow-up**:** 6, 12, 18 months
Outcomes	• Abstinence: from drug use, corroborated by urinalysis • Percentage of abstinence
Notes	**Funding:** work supported by Trust for the Promotion of Scientific Applied Research and Technology in Asturias, Spain **Conflict of interest:** no conflict of interest reported by authors **Country:** Spain

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Use of random number table noted
Allocation concealment (selection bias)	Unclear risk	No information reported
Blinding of participants and personnel (performance bias) subjective outcomes	Low risk	Being aware of receiving a psychosocial treatment is part of the therapeutic effect
Blinding of participants and personnel (performance bias) objective outcomes	Low risk	Being aware of receiving a psychosocial treatment is part of the therapeutic effect
Blinding (performance bias and detection bias) All outcomes	Low risk	Being aware of receiving a psychosocial treatment is part of the therapeutic effect
Blinding of outcome assessment (detection bias) subjective measures	Low risk	Urinalysis was used to corroborate self-reported abstinence
Blinding of outcome assessment (detection bias)	Low risk	The clinician who conducted the baseline assessments was also in charge of the administration of the measures

Lanza 2014 *(Continued)*

objective measures

Incomplete outcome data (attrition bias) All outcomes	Low risk	Similiar loss to follow-up across all three groups. A total of 9/50 lost (n = 4 for ACT, n = 3 for CBT and n = 2 for control)
Selective reporting (reporting bias)	Low risk	Protocol measures and information reported in the methods section of the paper were comparable

Messina 2010

Methods	Study design: RCT Study grouping: Parallel group
Participants	• 115 women • Age not reported • 100% women • 48% white • 100% drug-using • Alcohol use not reported • 79% reported a history of depression, 26% met the criteria for PTSD **Eligibility criteria:** women with a history of substance use with between 6 and 24 months left to serve on the sentence
Interventions	CBT and other therapies versus prison-based TC programme **Experimental intervention** The Gender Responsive Treatment (GRT) model encompasses manualised curricula designed to be relevant to the needs of drug-dependent women in correctional programmes. Each provides a facilitator's guide and a participant's workbook. Both curricula use CBT approaches, mindfulness meditation, experiential therapies (guided imagery, visualisation, art therapy, movement), psychoeducational, relational, and expressive arts techniques. Helping Women Recover is a 17-session programme organised into four modules. • Self-module: women discover what the 'self' is; learn that addiction can be understood as a disorder of the self; learn the sources of self-esteem; consider the effects of sexism, racism, and stigma on a sense of self; and learn that recovery includes the growth of the self. • Relationship module: women explore their roles in their families of origin; discuss myths and realities about motherhood and their relationships with their mothers; review relationship histories; and consider how they can build healthy support systems. • Sexuality module: women explore the connections between addiction and sexuality and discuss body image, sexual identity, sexual abuse, and the fear of sex when sober. • Spirituality module: women are introduced to the concepts of spirituality, prayer, and meditation. Spirituality deals with transformation, connection, meaning, and wholeness. Beyond Trauma consists of 11 sessions focused on three areas: teaching women what trauma and abuse are, helping them to understand typical reactions to trauma and abuse, and developing coping skills (n = 60). **Setting**: prison length of treatment: 6 months Length of follow-up: 6 and 12 months

Messina 2010 *(Continued)*

	Control Prison-based TC programmes in California are based on the traditional aspects of TC treatment and include the following. • Activities that embody positive values that start a process of socialisation. • Treatment staff who provide positive role models (and many are recovering addicts themselves) • An alternative concept of inmates that is usually much more positive than the prevailing beliefs and attitudes held by correctional staff. Programming takes place during the week, and participants spend approximately 20 hours per week in treatment. A voluntary aftercare component for graduates from the prison-based TC programmes provides funding for up to 6 months of continued treatment (residential or outpatient services) in the community following release to parole. Typically, gender issues and trauma histories were not addressed in these prison TC programmes. In addition, both men and women were employed as treatment staff to facilitate the groups and counsel the women (n = 55). **Setting**: prison length of treatment: 6 months Length of follow-up: 6 and 12 months
Outcomes	• Community-based aftercare participation • Drug use • ASI Severity Index Lite • Psychological well-being • Self-efficacy • Recidivism
Notes	**Funding:** This study was funded by the National Institute on Drug Abuse (Grant R21 DAO18699-01A1) and an Interagency Agreement between University of California, Davis (Contract 07-002467), and UCLA Integrated Substance Abuse Programs (ISAP). The findings and conclusions of this study are those of the authors and do not necessarily represent the official policies of the California Department of Corrections and Rehabilitation. **Conflict of interest:** no declaration of interest reported by the authors **Country:** USA

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Random sequence based on an even and odd identification number
Allocation concealment (selection bias)	Unclear risk	No evidence reported with regards to concealment
Blinding of participants and personnel (performance bias) subjective outcomes	Low risk	Being aware of receiving a psychosocial treatment is part of the therapeutic effect
Blinding of participants and personnel (performance bias) objective outcomes	Low risk	Being aware of receiving a psychosocial treatment is part of the therapeutic effect

Messina 2010 *(Continued)*

Blinding (performance bias and detection bias) All outcomes	Low risk	Being aware of receiving a psychosocial treatment is part of the therapeutic effect
Blinding of outcome assessment (detection bias) subjective measures	Unclear risk	No evidence to provide information about whether the assessors were blind
Blinding of outcome assessment (detection bias) objective measures	Unclear risk	No evidence to provide information about whether the assessors were blind
Incomplete outcome data (attrition bias) All outcomes	Low risk	ITT analysis was conducted
Selective reporting (reporting bias)	Low risk	No evidence of selective reporting

Needles 2005

Methods	Study design: RCT Study grouping: Parallel group
Participants	• 704 adults • Mean age 34.7 (SD not reported) • 100% female • Ethnicity not reported • 88.4% drug users in the past 6 months • Alcohol use: 47.7% received alcohol or substance abuse treatment in 12 months before incarceration • Mental health not reported **Eligibility criteria** Not reported, but reports that Health Link staff sought to enrol clients facing significant barriers to successful reintegration. Nearly 90% of the female clients reported drug use, 54% lacked high school diplomas, 36% had been homeless during the preceding year, and nearly one-fifth were HIV positive. More than 90% of the adolescent males had not graduated from high school, 85% reported recent drug use, and 47% said that illegal activities were their primary source of income.
Interventions	Intensive discharge planning services and community-based case management services versus less intensive discharge planning and no community-based services: referred to as 'jail services only'. **Experimental intervention** Health Link (community-based services): to provide support to women on community health problems and other needs in the community upon release from prison. The goals of the programme were to access drug treatment and primary health care, engagement in supportive social networks and enrolment in training or school. The programme aimed to reduce drug use, rearrest rates and HIV risk behaviour. During voluntary group meetings case workers helped clients identify personal problems, build peer support and develop trusting caseworker-client relationships. Individual group counselling supplemented the group sessions (n = 352). **Setting**: prison into community Length of treatment: not reported

Needles 2005 *(Continued)*

	Length of follow-up: during 12 months follow-up **Control** Were offered less intensive discharge planning services and did not have access to Health Link services (n = 352). **Setting**: prison into community Length of treatment: not reported Length of follow-up: during 12 months
Outcomes	The following were measured during a 1-year follow-up period. • Arrested • Had serious arrest charge, including murder or assault, robbery, and burglary, • Had drug charge, including drug,law violations related to drug sales or drug possession • Convicted on at least one charge • Sentenced to incarceration • Self-reported use of any drug in past 3 months • Self-reported use of any hard drug in past 3 months • Self-reported use of marijuana in past 3 months • Cocaine/crack negative hair test results • Cocaine/crack positive hair test results • Marijuana negative hair test results • Marijuana positive hair test results
Notes	**Funding:** The Robert Wood Johnson Foundation funded the Evaluation of the Health Link Program through a contract to Mathematica Policy Research, Inc. The Robert Wood Johnson Foundation also funded the Health Link demonstration service delivery under separate contracts to the Fortune Society and the Hunter College Center on AIDS, Drugs, and Community Health. **Conflict of interest:** not reported **Country: USA**

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Methods for the random sequence generation not reported
Allocation concealment (selection bias)	Unclear risk	Methods for participant allocation not reported
Blinding of participants and personnel (performance bias) subjective outcomes	Low risk	Being aware of receiving a psychosocial treatment is part of the therapeutic effect
Blinding of participants and personnel (performance bias) objective outcomes	Low risk	Being aware of receiving a psychosocial treatment is part of the therapeutic effect
Blinding (performance bias and detection bias)	Low risk	Being aware of receiving a psychosocial treatment is part of the therapeutic effect

Needles 2005 *(Continued)*
All outcomes

Blinding of outcome assessment (detection bias) subjective measures	High risk	Follow-up interviewers could not be blind to allocation of intervention because interview questions addressed participants' interaction with Health Link, the organisation offering the intervention.
Blinding of outcome assessment (detection bias) objective measures	Low risk	Follow-up interviewers could not be blind to allocation of intervention because interview questions addressed participants' interaction with Health Link, the organisation offering the intervention. However, objective outcomes unlikely to be biased by lack of blindness
Incomplete outcome data (attrition bias) All outcomes	High risk	Results reported for completers with what appears to be > 10% withdrawing/missing data for all study groups
Selective reporting (reporting bias)	Unclear risk	The stated outcomes of interest were reported. However, there is no confirmatory evidence of a published trial protocol. It is therefore not possible to comment on the risk of bias in selective outcome reporting.

Nielsen 1996

Methods	Study design: RCT Study grouping: Parallel group
Participants	• 689 adults and young offenders (women n = 144) • Age not reported • 79.1% male • 28.9% white • 100% drug-using • Alcohol use not reported • Psychiatric history not reported **Eligibility criteria:** offenders with a history of drug use who were eligible for work release or parole and about to be released from prison
Interventions	Secure establishment-based TC programme versus routine work release **Experimental intervention** CREST work-release TC 1 month of orientation followed by 2 months of primary treatment followed by 3 months of work release. This was intensive given the nature of the intervention (n = 248). **Setting**: prison Length of treatment: 6 months Length of follow-up: 6, 18 months **Control** Routine work-release (n = 441) Duration also 6 months, intensity not reported **Setting**: prison Length of treatment: 6 months

Nielsen 1996 *(Continued)*

	Length of follow-up: 6, 18 months
Outcomes	Drug use (self-reported) during the last 6 months at 6-month follow-up Drug use (self-reported) during the last 18 months at 18-months follow-up Recidivism (arrested and charged) for any offence (self-reported) during the last 6 months at 6-month follow-up Recidivism (arrested and charged) for any offence (self-reported) during the last 18 months at 18-months follow-up
Notes	**Funding:** This research was supported by PHS Grants R18 DAO6948 and R37 DAO6124 from the National Institute on Drug Abuse. **Conflict of interest:** no declaration of interest reported by the authors **Country:** USA

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	No information reported
Allocation concealment (selection bias)	Unclear risk	No information reported
Blinding of participants and personnel (performance bias) subjective outcomes	Low risk	Being aware of receiving a psychosocial treatment is part of the therapeutic effect
Blinding of participants and personnel (performance bias) objective outcomes	Low risk	Being aware of receiving a psychosocial treatment is part of the therapeutic effect
Blinding (performance bias and detection bias) All outcomes	Low risk	Being aware of receiving a psychosocial treatment is part of the therapeutic effect
Blinding of outcome assessment (detection bias) subjective measures	Unclear risk	No evidence to provide information about whether the assessors were blind
Blinding of outcome assessment (detection bias) objective measures	Unclear risk	No evidence to provide information about whether the assessors were blind
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	No ITT analysis conducted. No explanation of the impact of withdrawals
Selective reporting (reporting bias)	Low risk	Protocol was obtained and research outcomes reported as expected

Nyamathi 2017

Methods	Study design: RCT Study grouping: Parallel group
Participants	• 130 adults • Mean age 38.6 (SD 11.3) • 100% female • 41% black • 69% drug use during the last 6 months based on urine analysis • Alcohol use: 41.5% had used in the past 6 months • 44.6% reported depressive symptomology **Eligibility criteria** • Having used drugs prior to their most recent incarceration • Ages 18–65 years • Were considered homeless prior to discharge from incarceration
Interventions	DBT-CM versus health promotion comparator **Experimental intervention** DBT-CM consisted of six weekly group sessions (with 5 to 7 individuals per group) and six weekly one-on-one sessions, each lasting, on average, 45–60 minutes for a total of 12 weeks. The six DBT-CM sessions were organised into the following topics: avoiding and eliminating cues to use, burning bridges over substance use, building a life worth living, observing urges, adaptive denial and alternative rebellion. Each session included signing in, mindfulness, and diary card/review of homework. Six individual sessions were also included (n = 65). **Setting**: community length of treatment: 12 weeks Length of follow-up: 6 months **Control** Health promotion programme, a dedicated nurse and two community health workers were trained to deliver a programme focused on common chronic diseases that homeless women face and Health promotion activities for these chronic diseases using six weekly group sessions and six individual sessions. The six health promotion sessions conducted weekly focused on: diabetes, heart disease, sexually transmitted infections including HIV, parenting skills, community and family reintegration and other topics (n = 65). **Setting**: community length of treatment: 6 weeks Length of follow-up: 6 months
Outcomes	All outcomes measured at 6 months • Positive drug use in urine analyses, confirmation by self-report • No marijuana use in urine analyses, confirmation by self-report • No crack cocaine use in urine analyses, confirmation by self-report • No cocaine use in urine analyses, confirmation by self-report • No heroin use in urine analyses, confirmation by self-report • No methamphetamine in urine analyses, confirmation by self-report • Not any drug use in self-report

Nyamathi 2017 *(Continued)*

- Not any drug use in urine analyses, confirmation by self-report

Notes	**Funding:** The study was funded by the National Institute on Drug Abuse (R34DA035409, NIAID K01 AI1 18559). The project was supported by the National Center for Advancing Transnational Sciences, National Institutes of Health, through Grant UL1 TR0001241. **Conflict of interest:** The authors have no conflicts of interest to report. **Country:** USA

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Participants were randomised to interventions using computer-based urn randomisation
Allocation concealment (selection bias)	Unclear risk	Method for concealing allocation to study groups not reported
Blinding of participants and personnel (performance bias) subjective outcomes	Low risk	Being aware of receiving a psychosocial treatment is part of the therapeutic effect
Blinding of participants and personnel (performance bias) objective outcomes	Low risk	Being aware of receiving a psychosocial treatment is part of the therapeutic effect
Blinding (performance bias and detection bias) All outcomes	Low risk	Being aware of receiving a psychosocial treatment is part of the therapeutic effect
Blinding of outcome assessment (detection bias) subjective measures	Unclear risk	Not reported if outcome assessors were blinded or not
Blinding of outcome assessment (detection bias) objective measures	Unclear risk	Not reported if outcome assessors were blinded or not
Incomplete outcome data (attrition bias) All outcomes	High risk	Outcome data reported for 58/65 (89%) in both study groups for participants who completed programme activities Although missing outcome data are equal across intervention groups, the authors do not state whether there was an imbalance in the reasons for missing data in the two groups.
Selective reporting (reporting bias)	High risk	The number of visits to healthcare or social service providers was stated as a secondary outcome in the protocol but was not reported in the published study. The identification of baseline predictors of outcome success (abstinence) was reported in the study as a secondary outcome but was not mentioned in the study protocol. NCT02258423 accessed 22 June 2018

Sacks 2008

Methods	Study design: RCT

Sacks 2008 *(Continued)*

	Study grouping: Parallel group
Participants	• 573 adult women • Mean age 35.6 (SD 7.5) • 100% female • 47.8% white • 99% drug-using **Eligibility criteria:** female inmates with at least 6 months remaining until parole with serious substance abuse problems requiring treatment and presenting a minimum/medium security risk
Interventions	TC programme versus treatment as usual **Experimental intervention** TCs were initially designed for use in community-based residential settings, and the model has been successfully adapted for inmate populations. The model has been further modified for male inmates with co-occurring serious mental and substance use disorders, with previous evidence showing positive outcomes for reincarceration, substance use, and mental health symptoms. The intervention involved a 6-month tenure in separate residential building with programme activities 4 hours per day. The programme followed TC principles, with additional gender specific aspects (n = 257). **Setting:** prison **Length of treatment:** 5 days per week for 4 hours per day (and supplemented on a weekend with an additional 4 hours per day) average length of time spent was 6.5 months **Length of follow-up:** 6, 12, 18 months post-prison release **Control group** The control programme, based at Colorado Department of Corrections (CDOC) standard treatment, known in the CDOC system as the Intensive Outpatient Programme (IOP). This is the standard treatment that CDOC offers to all female offenders who have been classified as substance abusers. The intervention is designed to address substance abuse and criminality, with a focus on prevention of relapse and recidivism. The Intensive Outpatient Programme substance abuse treatment curriculum consists of a 90-hour course, presented in an educational format, utilising a cognitive behavioural format to address underlying issues of substance use/abuse and criminal behaviour. The women in the Intensive Outpatient Programme can participate in multiple other services, including mental health assessments (n = 211). **Setting:** prison Length of treatment: 2 days per week for 2 hours per week. Duration was approximately between 6 and 9 months Length of follow-up: 6, 12, and 18 months post-prison release
Outcomes	• Criminal activity • Arrest • Parole violation • Drug-related activity (self-reported) • Criminal record data (% incarcerated, mean days to incarceration) • Self-reported illegal drug use
Notes	**Funding:** Work supported by US Department of Health and Human Services (DHHS), National Institutes of Health (NIH), National Institute on Drug Abuse (NIDA) **Conflict of interest:** no declarations of interest are noted by the authors **Country:** USA

Sacks 2008 *(Continued)*

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	No information other than "were randomly assigned"
Allocation concealment (selection bias)	Unclear risk	No information provided
Blinding of participants and personnel (performance bias) subjective outcomes	Low risk	Being aware of receiving a psychosocial treatment is part of the therapeutic effect
Blinding of participants and personnel (performance bias) objective outcomes	Low risk	Being aware of receiving a psychosocial treatment is part of the therapeutic effect
Blinding (performance bias and detection bias) All outcomes	Low risk	Being aware of receiving a psychosocial treatment is part of the therapeutic effect
Blinding of outcome assessment (detection bias) subjective measures	Unclear risk	No evidence to provide information about whether the assessors were blind
Blinding of outcome assessment (detection bias) objective measures	Unclear risk	No evidence to provide information about whether the assessors were blind
Incomplete outcome data (attrition bias) All outcomes	High risk	No loss to follow-up for reincarceration outcome but unclear loss to follow-up for other outcomes. ITT reported. Differences also noted between data collected using self-report and official records. ITT analysis used to analyse the outcome measures
Selective reporting (reporting bias)	Low risk	No evidence of selective reporting

Zlotnick 2009

Methods	Study design: RCT Study grouping: Parallel group
Participants	• 103 female inmates • Mean age 34.6 (SD 7.9) • 100% women • 46.7% white • 100% drug-using • Alcohol use not reported **Eligibility criteria:** female inmates requesting intensive substance abuse treatment
Interventions	CBT and standard therapy versus treatment as usual

Zlotnick 2009 *(Continued)*

Experimental intervention

Intervention group - CBT using a Seeking Safety programme plus standard therapy.

The primary goals of the intervention include the development of coping skills to help clients attain safety from both PTSD and substance use disorder (SUD). The intervention is present-focused, abstinence-oriented, and emphasises an empowering, compassionate approach. The intervention is conducted using a group modality for 90 min, typically three times per week for 6 to 8 weeks while the women were in prison, with three to five women per group. Standard therapy comprises 180-240 hours of group treatment over 6-8 weeks. After release from prison, each woman was offered weekly individual 60 min "booster" sessions for 12 weeks to reinforce material from the group sessions (n = 27).

Setting: prison

Length of treatment: 6-8 weeks followed by a further 12 weeks booster session

Length of follow -up: 3 and 6 months

Control

Women in the treatment as usual group (or standard therapy) were enrolled in a substance use treatment programme in the minimum security wing (approximately 30 hours per week). Women typically attend this programme for 3 to 6 months, depending on the length of their sentences. Substance use treatment was abstinence-oriented, focused on the 12-step model (Alcoholics Anonymous, Cocaine Anonymous, Narcotics Anonymous), and took place in a psychoeducational large-group format, with weekly individual case management and drug counselling. To remain in the treatment as usual programme, the women had to attend all components of the treatment. Psychoeducational groups included attention to women's health, domestic violence, affect management, relapse prevention, career exploration, anger management, and parenting, conducted by the same clinicians who conducted the Seeking Safety treatment. This programme did not offer any treatment specifically for trauma. Prior to prison release, the women received case management services, although this discontinued once the women were released from prison. All women leaving prison were referred for further substance use treatment. The treatment as usual programme was similar to other state prison substance use programmes in that more than 75% of states offer programmes in TC settings, in day treatment settings, teach relapse prevention, and offer substance use education (n = 22).

Setting: prison

Length of treatment: 3 to 6 months

Length of follow-up: 3 and 6 months

Outcomes	• Drug use (self-reported) • Recidivism
Notes	**Funding:** This study was supported by a grant to Caron Zlotnick from the National Institute of Drug Abuse (DA013935-03). **Conflict of interest:** no declaration of interest reported by the authors **Country:** USA

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	No information reported other than "random"

Zlotnick 2009 *(Continued)*

Allocation concealment (selection bias)	Unclear risk	No information reported
Blinding of participants and personnel (performance bias) subjective outcomes	Low risk	Being aware of receiving a psychosocial treatment is part of the therapeutic effect
Blinding of participants and personnel (performance bias) objective outcomes	Low risk	Being aware of receiving a psychosocial treatment is part of the therapeutic effect
Blinding (performance bias and detection bias) All outcomes	Low risk	Being aware of receiving a psychosocial treatment is part of the therapeutic effect
Blinding of outcome assessment (detection bias) subjective measures	High risk	The assessors were not blind and were aware of the assignment
Blinding of outcome assessment (detection bias) objective measures	High risk	The assessors were not blind and were aware of the assignment
Incomplete outcome data (attrition bias) All outcomes	Low risk	Very low and equally balanced attrition indicated in flow chart
Selective reporting (reporting bias)	Unclear risk	No protocol identified

ACT: acceptance and commitment therapy
CBT: cognitive behavioural therapy
DBT-CM - dialectic behavioural therapy with case management
DSM-IV: Diagnostic and Statistical Manual of Mental Disorders, 4th Edition
ITT: intention-to-treat
LCSF: lifestyle criminality screening form
MDD: major depressive disorder
PTSD: post-traumatic stress disorder
RCT: randomised controlled trial
SD: standard deviation
TC: therapeutic community

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

Study	Reason for exclusion
AAAP 2017	Conference proceedings only; not enough available data to extract
Alemagno 2009	Not measuring drug or crime outcomes
Alemi 2010	Not female offenders
Allen 2017	Not measuring drug or crime outcomes

Study	Reason for exclusion
Andersen 2018	No relevant outcomes
Anonymous 2004	Not an offender population
Anonymous 2015	Conference proceeding only; not enough data provided to be extracted
Anonymous 2016a	Not measuring drug or crime outcomes
Anonymous 2018	Conference proceedings only; not enough data provided to be extracted
Barrett 2015	Not measuring drug or crime outcomes
Bartlett 2015	Not measuring drug or crime outcomes
Bawor 2014	Not an offender population
Bazazi 2017	Not a randomised controlled trial
Berman 2004	Not a female population
Brahen 1976	Not a randomised controlled trial
Brinkley 2018	Not a female offender population
Brodie 2009	This is not a female population
Brovko 2016	Not measuring drug or crime outcomes
Brown 2013	Not a female population
Brown 2014	Not a randomised controlled trial
Burraston 2014	Not a randomised controlled trial
Bustos 2016	Not measuring drug or crime outcomes
Calcaterra 2014	Not a randomised controlled trial
Calsyn 2005	Not an offender population
Carrieri 2017	Not an offender population
Carroll 2006	Not a female population
Carroll 2012	Not a female population
Chaple 2014	This does not contain a female population
Chaple 2016	This does not contain a female population
Cheesman 2016	Not a randomised controlled trial
Cihlar 2014	Not a randomised controlled trial
Clair 2013	Not a randomised controlled trial

Study	Reason for exclusion
Clair-Michaud 2016	Not measuring drug or crime outcomes
Clark 2002	Not a randomised controlled trial
Clayton 2013	Not measuring drug or crime outcomes
Compton 2016	Not a randomised controlled trial
Cowell 2018	Not a female offender population
CPDD 2014	Conference proceeding only; not enough data provided to be extracted
Cullen 2012	This is not a female population
Curtis 2015	Not a randomised controlled trial
Czuchry 2000	Not measuring drug or crime outcomes
Czuchry 2003	Not measuring drug or crime outcomes
D'Amico 2013	This is not a female population
Dakof 2010	This is not a female population
Dakof 2015	This is not a female population
Daughters 2018	Not an offender population
Davis 2015	This is not a randomised controlled trial
Day 2006	This is not an offender population
Demaret 2015	This is not an offender population
Di Paola 2014	This is not a female population
Dickson 2017	This is not a randomised controlled trial
Dolan 2003	This is not a female population
Dolan 2005	This is not a female population
Dole 1969	This is not a female population
Doyle 2015	This is not a randomised controlled trial
Doyle 2016	This is not a randomised controlled trial
Dunlop 2017	This is not an offender population
Easton 2007	This is not a randomised controlled trial
Easton 2018	Not a female offender population
Egg 2000	This is not a female population

Study	Reason for exclusion
Ellison 2018	Not a female offender population
Europad 2016	Conference proceeding only; not enough data provided to be extracted
Friedmann 2015	Conference proceeding only; not enough data to be extracted
Friedmann 2017	This is not a female population
Ginsberg 2012	Not measuring drug or crime outcomes
Ginsberg 2015	Not measuring drug or crime outcomes
Ginsberg 2015a	Not measuring drug or crime outcomes
Gisev 2015	This is not a randomised controlled trial
Gisev 2015a	This is not a randomised controlled trial
Gisev 2015b	This is not a randomised controlled trial
Goddard-Eckrich 2018	This is not measuring drug or crime outcomes
Goorden 2015	Not an offender population
Gordon 2014	This is not measuring drug or crime outcomes
Gordon 2015	This is not a randomised controlled trial
Gordon 2018	Not a female offender population
Gottfredson 2005	This is not a female population
Gould 2014	This is not an offender population
Haig 2003	This is not a randomised controlled trial
Hanlon 1975	This is not a female population
Hanlon 1977	This is not a female population
Harada 2012	This is not measuring drug or crime outcomes
Heimer 2006	This is not a randomised controlled trial
Henderson 2010	This is not a female population
Henderson 2016	This is not a female population
Hendriks 2011	This is not an offender population
Henggeler 2006	This is not a female population
Herrman 2016	This is not an offender population
Himelstein 2014	This is not measuring drug or crime outcomes

Study	Reason for exclusion
Himelstein 2015	This is not a randomised controlled trial
Hoffman 1996	This is not an offender population
Holloway 2006	This is not a female population
Horn 2018	Not a RCT design
Hser 2013	This is not an offender population
Jalali 2017	This is not measuring drug or crime outcomes
Jason 2007	This is not an offender population
Jason 2015	This is not a female population
Jason 2016	This is not a randomised controlled trial
Jerrell 1995	This is not an offender population
Joe 1997	This is not an offender population
Jouhanneau 2018	Not a RCT design
Kearley 2018	This is not a female population
Kelly 2016	This is not measuring drug or crime outcomes
Khawcharoenporn 2018	No relevant outcomes
Kinlock 2007	This is not a female population
Kinlock 2009	This is not a female population
Kirkpatrick 2018	Not a female offender population
Knight 2016	This is not measuring drug or crime outcomes
Knudsen 2014	This is not measuring drug or crime outcomes
Knudsen 2016	This is not a randomised controlled trial
Kongsakon 2005	This is not measuring drug or crime outcomes
Konstenius 2014	This is not a female population
Kopak 2015	This is not a randomised controlled trial
Korchmaros 2018	Not a RCT design
Korchmaros 2018b	Not a RCT design
Krebs 2017	This is not a randomised controlled trial
Kubiak 2016	This is not a randomised controlled trial

Study	Reason for exclusion
Kurland 1975	This is not a female population
Kurniasanti 2014	This is not a randomised controlled trial
Le Page 2018	Not a RCT design
Lee 2011	This is not measuring drug or crime outcomes
Lee 2013	This is not a randomised controlled trial
Lee 2014a	This is not measuring drug or crime outcomes
Lee 2014b	This is not measuring drug or crime outcomes
Lee 2014c	Conference proceedings only; not enough data to be extracted
Lee 2015a	Conference proceedings only; not enough data to be extracted
Lee 2015b	This is not a female population
Lee 2015c	This is not a female population
Lee 2016a	This is not a female population
Lee 2016b	This is not a female population
Lefevre 2018	No appropriate outcome measures
Lehman 2015	This is not measuring drug or crime outcomes
Lerch 2017	This is not a female population
Liddle 2011	This is not measuring drug or crime outcomes
Lin 2018	No relevant outcome measures
Lintzeris 2006	This is not an offender population
Little 1993	This is not an offender population
Lo 2012	This is not a female population
Lobmann 2007	This is not a female population
Lopez 2019	Not an offender population
Luciano 2014	This is not an offender population
Magura 2009	This is not a female population
Malouf 2017	This is not a female population
March 2006	This is not a female population
Marinelli-Casey 2008	This is not a randomised controlled trial

Study	Reason for exclusion
Marlowe 2008	This is not a female population
Marlowe 2009	This is not a female population
Martin 2010	This is not measuring drug or crime outcomes
Martin 2011	This is not an offender population
Martin 2014	This is not an offender population
Martin 2015	This is not measuring drug or crime outcomes
Martin 2017	This is not an offender population
Mazerolle 2000	This is not an offender population
McAuliffe 1990	This is not an offender population
McCarter 2016	This is not a female population
McCollister 2014	This is not a randomised controlled trial
McCollister 2015	Conference proceeding only; not enough data to be extracted
McCollister 2016	This is not an offender population
McCollister 2017	This is not a randomised controlled trial
McKenzie 2012	This is not a female population
Meade 2018	Not a female population
Metrebian 2015	This is not an offender population
Mitchell 2013	This is not an offender population
Mitchell 2014	This is not an offender population
Murphy 2017	This is not a female population
NCT03556618	Not a female offender population
Nemes 1999	This is not a female population
Nirenberg 2013	This is not measuring drug or crime outcomes
Nirenberg 2013a	This is not measuring drug or crime outcomes
Nosyk 2010	This is not an offender population
Nyamathi 2014a	This is not a randomised controlled trial
Nyamathi 2014b	This is not a randomised controlled trial
Nyamathi 2015	This is not measuring drug or crime outcomes

Study	Reason for exclusion
Nyamathi 2016	This is not a randomised controlled trial
O'Brien 2015	This is not a randomised controlled trial
O'Brien 2017	This is not a randomised controlled trial
Owens 2016	This is not measuring drug or crime outcomes
Owens 2017	This is not measuring drug or crime outcomes
Page 1982	This is not measuring drug or crime outcomes
Parmar 2017	This is not a female population
Pettus-Davis 2017	This is not measuring drug or crime outcomes
Pierce 2018	This is not a randomised controlled trial
Pijl 2017	This is not a randomised controlled trial
Pitre 1997	This is not measuring drug or crime outcomes
Pitre 1998	This is not measuring drug or crime outcomes
Poblete 2017	This is not an offender population
Polcin 2018	Not a female offender population
Prendergast 2015	This is not measuring drug or crime outcomes
Prendergast 2017	This is not a female population
Randall 2018	Not a RCT
Reingle Gonzalez 2018	No relevant outcomes
Rich 2015	This is not a female population
Roll 2005	This is not an offender population
Rowe 2007	This is not an offender population
Rowland 2008	This is not a randomised controlled trial
Sajatovic 2013	This is not an offender population
Saxena 2014	This is not measuring drug or crime outcomes
Schaeffer 2014	This is not a female population
Scott 2017	This is not measuring drug or crime outcomes
Seitz-Brown 2015	This is a conference proceeding only; not enough data to be extracted
Shaul 2016	This is not a female population

Study	Reason for exclusion
Sheard 2007	This is not a randomised controlled trial
Sheard 2009a	This is not a female population
Sheard 2009b	This is not a female population
Shearer 2003	This is not an offender population
Shearer 2007	This is not a randomised controlled trial
Sinha 2003	This is not a female population
Smelson 2019	Not a RCT design
Smith 2017	This is not an offender population
Soares 2018	No relevant outcome data
Soares 2019	Not a female offender population
Somers 2013	This is not measuring drug or crime outcomes
Spohr 2015	This is not measuring drug or crime outcomes
Spohr 2018	No relevant outcomes
Springer 2017	This is not measuring drug or crime outcomes
Springer 2018	Not a female offender population
Stein 2011	This is not a female population
Sticca 2014	This is not a randomised controlled trial
Stillwell 2017	This is not a randomised controlled trial
Strang 2000	This is not an offender population
Sundell 2008	This is not a female population
Swogger 2016	This is not a female population
Thompson 2018	Not a female offender population
Tolou-Shams 2011	This is not measuring drug or crime outcomes
Vagenas 2017	This is not measuring drug or crime outcomes
Van der pol 2018	Not an offender population
van Stelle 2004	This is not a randomised controlled trial
Vaucher 2016	This is not measuring drug or crime outcomes
Villagra 2013	This is not a female population

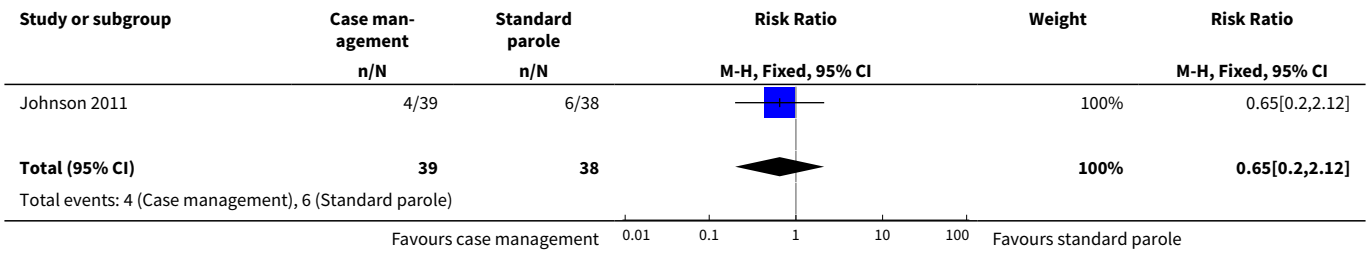
Study	Reason for exclusion
Warren 2006	This is not an offender population
Welsh 2014	This is not measuring drug or crime outcomes
White 2018	Not a RCT design
Wimberley 2018	Not a female offender population
Wimberly 2018	This is not measuring drug or crime outcomes
Witkiewitz 2014	This is not measuring drug or crime outcomes
Wolff 2012	This is not a randomised controlled trial
Wooditch 2015	This is not a randomised controlled trial
Wooditch 2017	This is not measuring drug or crime outcomes
Wright 2011	This is not a female population
Zlotnick 2003	This is not measuring drug or crime outcomes

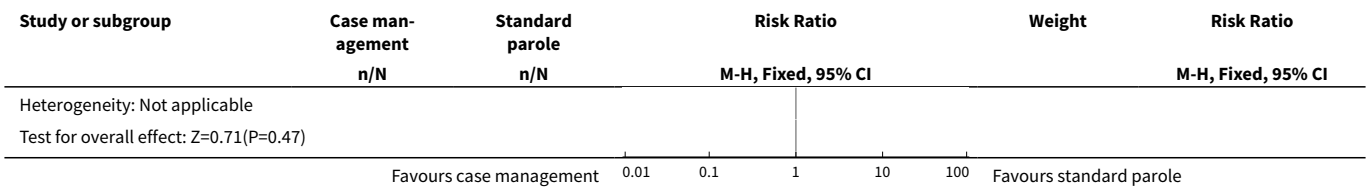
DATA AND ANALYSES

Comparison 1. Collaborative case management versus treatment as usual

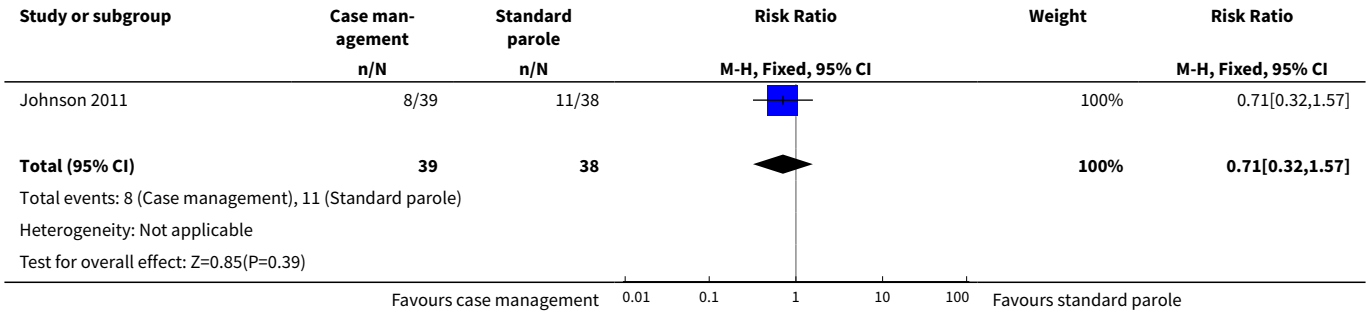
Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Use of primary drug during 9 month follow-up	1	77	Risk Ratio (M-H, Fixed, 95% CI)	0.65 [0.20, 2.12]
2 Reincarceration at 9 months	1	77	Risk Ratio (M-H, Fixed, 95% CI)	0.71 [0.32, 1.57]
3 Number of arrests	1	113	Risk Ratio (M-H, Fixed, 95% CI)	1.11 [0.83, 1.49]

Analysis 1.1. Comparison 1 Collaborative case management versus treatment as usual, Outcome 1 Use of primary drug during 9 month follow-up.

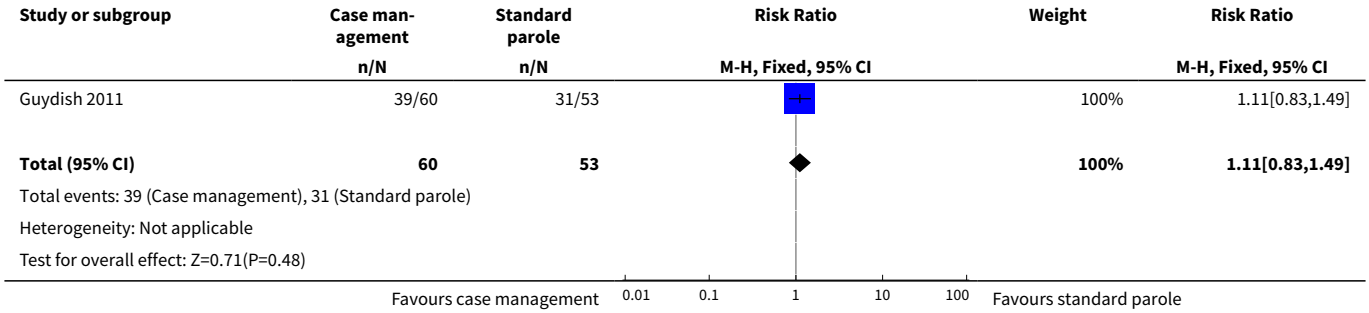




Analysis 1.2. Comparison 1 Collaborative case management versus treatment as usual, Outcome 2 Reincarceration at 9 months.



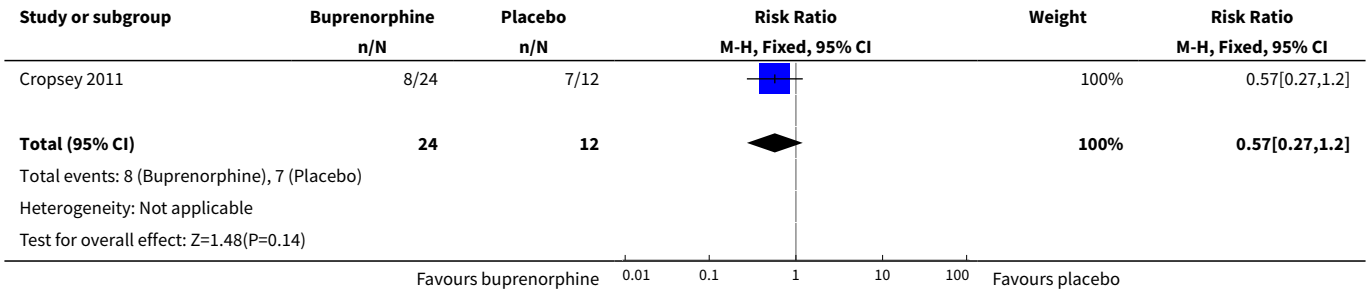
Analysis 1.3. Comparison 1 Collaborative case management versus treatment as usual, Outcome 3 Number of arrests.



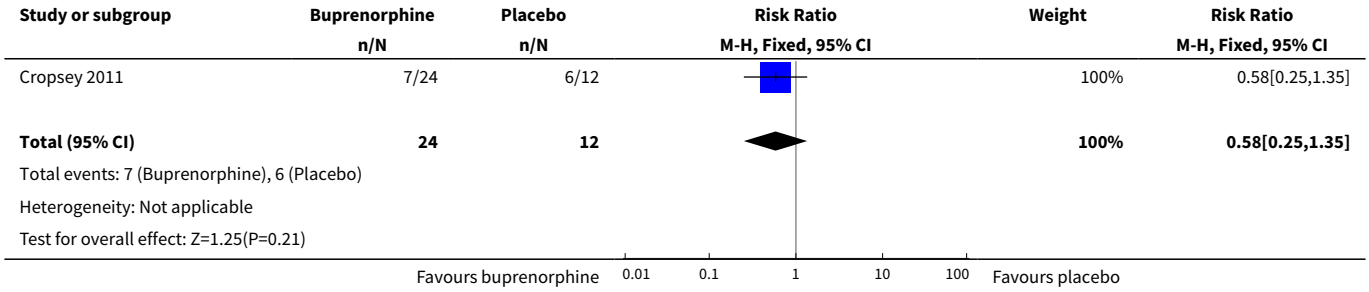
Comparison 2. Community-based buprenorphine versus placebo

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 End of treatment drug use	1	36	Risk Ratio (M-H, Fixed, 95% CI)	0.57 [0.27, 1.20]
2 Drug use at 3 months follow-up	1	36	Risk Ratio (M-H, Fixed, 95% CI)	0.58 [0.25, 1.35]

Analysis 2.1. Comparison 2 Community-based buprenorphine versus placebo, Outcome 1 End of treatment drug use.



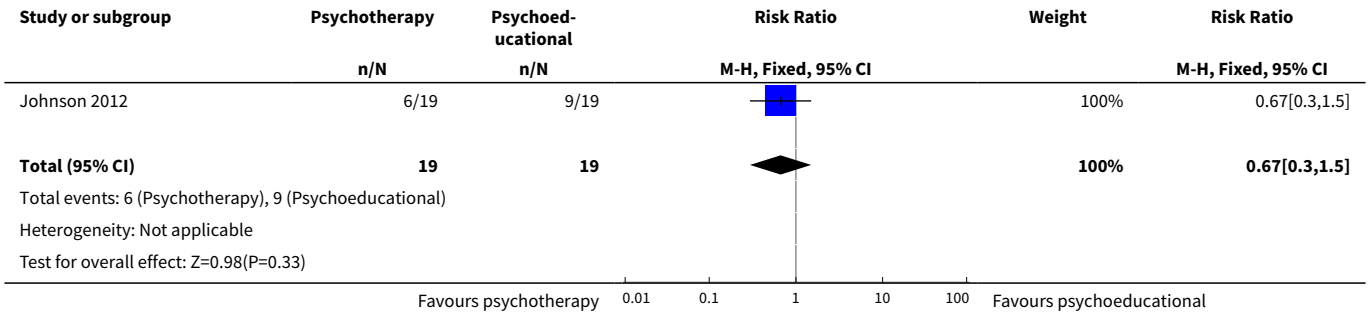
Analysis 2.2. Comparison 2 Community-based buprenorphine versus placebo, Outcome 2 Drug use at 3 months follow-up.



Comparison 3. Interpersonal psychotherapy versus psychoeducational control

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Relapse to drug use at 3 months	1	38	Risk Ratio (M-H, Fixed, 95% CI)	0.67 [0.30, 1.50]

Analysis 3.1. Comparison 3 Interpersonal psychotherapy versus psychoeducational control, Outcome 1 Relapse to drug use at 3 months.

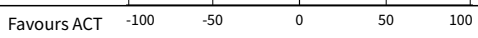


Comparison 4. Acceptance and commitment therapy (ACT) versus waiting list control

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Self-reported ASI drug use	1	31	Mean Difference (IV, Fixed, 95% CI)	-0.04 [-0.37, 0.29]
2 Abstinence from drug use	1	31	Risk Ratio (M-H, Fixed, 95% CI)	2.89 [0.73, 11.43]

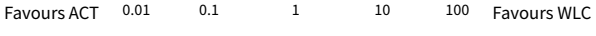
Analysis 4.1. Comparison 4 Acceptance and commitment therapy (ACT) versus waiting list control, Outcome 1 Self-reported ASI drug use.

Study or subgroup	Acceptance commitment N	Acceptance commitment Mean(SD)	Waiting list control N	Waiting list control Mean(SD)	Mean Difference Fixed, 95% CI	Weight	Mean Difference Fixed, 95% CI
Lanza 2014	15	0.4 (0.6)	16	0.4 (0.4)		100%	-0.04[-0.37,0.29]
Total ***	**15**		**16**			**100%**	**-0.04[-0.37,0.29]**
Heterogeneity: Not applicable							
Test for overall effect: Z=0.23(P=0.81)							



Analysis 4.2. Comparison 4 Acceptance and commitment therapy (ACT) versus waiting list control, Outcome 2 Abstinence from drug use.

Study or subgroup	Acceptance Commitment n/N	Waiting list control n/N	Risk Ratio M-H, Fixed, 95% CI	Weight	Risk Ratio M-H, Fixed, 95% CI
Lanza 2014	8/18	2/13		100%	2.89[0.73,11.43]
Total (95% CI)	**18**	**13**		**100%**	**2.89[0.73,11.43]**
Total events: 8 (Acceptance Commitment), 2 (Waiting list control)					
Heterogeneity: Not applicable					
Test for overall effect: Z=1.51(P=0.13)					



Comparison 5. Cognitive behavioural therapy and other therapies versus prison therapeutic community

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Reincarceration at 12 months	1	115	Risk Ratio (M-H, Fixed, 95% CI)	0.70 [0.43, 1.12]
2 Arrested for any crime at 6 months	1	314	Risk Ratio (M-H, Fixed, 95% CI)	0.73 [0.52, 1.03]

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
3 Criminal activity at 6 months	1	314	Risk Ratio (M-H, Fixed, 95% CI)	0.80 [0.63, 1.03]
4 Drug-related crime at 6 months	1	314	Risk Ratio (M-H, Fixed, 95% CI)	0.95 [0.68, 1.32]
4.1 New Subgroup	1	314	Risk Ratio (M-H, Fixed, 95% CI)	0.95 [0.68, 1.32]
5 Self-reported drug use at 6 months	1	314	Risk Ratio (M-H, Random, 95% CI)	0.86 [0.58, 1.27]
6 Arrested (not parole violation) at 6 months	1	314	Risk Ratio (M-H, Random, 95% CI)	0.43 [0.25, 0.77]
6.1 Arrested (not parole violation)	1	314	Risk Ratio (M-H, Random, 95% CI)	0.43 [0.25, 0.77]

Analysis 5.1. Comparison 5 Cognitive behavioural therapy and other therapies versus prison therapeutic community, Outcome 1 Reincarceration at 12 months.

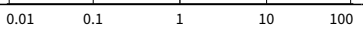
Study or subgroup	CBT and other therapies n/N	Therapeutic community n/N	Risk Ratio M-H, Fixed, 95% CI	Weight	Risk Ratio M-H, Fixed, 95% CI
Messina 2010	19/60	25/55		100%	0.7[0.43,1.12]
Total (95% CI)	**60**	**55**		**100%**	**0.7[0.43,1.12]**
Total events: 19 (CBT and other therapies), 25 (Therapeutic community)					
Heterogeneity: Tau^2=0; Chi^2=0, df=0(P<0.0001); I^2=100%					
Test for overall effect: Z=1.5(P=0.13)					

Analysis 5.2. Comparison 5 Cognitive behavioural therapy and other therapies versus prison therapeutic community, Outcome 2 Arrested for any crime at 6 months.

Study or subgroup	CBT and other therapies n/N	Therapeutic community n/N	Risk Ratio M-H, Fixed, 95% CI	Weight	Risk Ratio M-H, Fixed, 95% CI
Sacks 2008	42/163	53/151		100%	0.73[0.52,1.03]
Total (95% CI)	**163**	**151**		**100%**	**0.73[0.52,1.03]**
Total events: 42 (CBT and other therapies), 53 (Therapeutic community)					
Heterogeneity: Not applicable					
Test for overall effect: Z=1.79(P=0.07)					

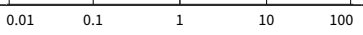
Analysis 5.3. Comparison 5 Cognitive behavioural therapy and other therapies versus prison therapeutic community, Outcome 3 Criminal activity at 6 months.

Study or subgroup	CBT and other therapies n/N	Therapeutic community n/N	Risk Ratio M-H, Fixed, 95% CI	Weight	Risk Ratio M-H, Fixed, 95% CI
Sacks 2008	65/163	75/151		100%	0.8[0.63,1.03]
Total (95% CI)	**163**	**151**		**100%**	**0.8[0.63,1.03]**
Total events: 65 (CBT and other therapies), 75 (Therapeutic community)					
Heterogeneity: Not applicable					
Test for overall effect: Z=1.74(P=0.08)					



Analysis 5.4. Comparison 5 Cognitive behavioural therapy and other therapies versus prison therapeutic community, Outcome 4 Drug-related crime at 6 months.

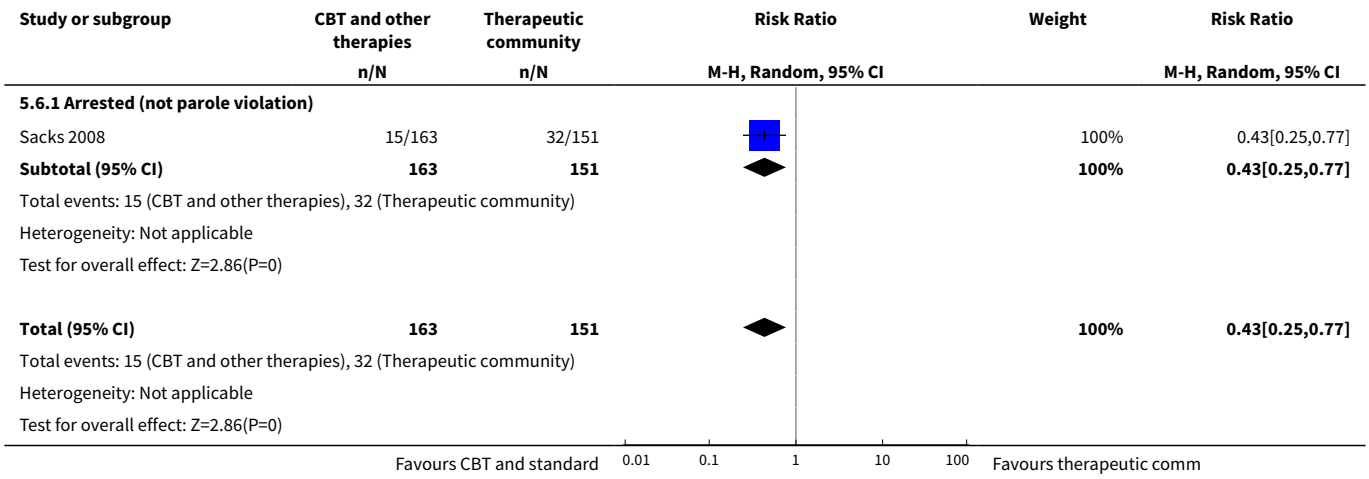
Study or subgroup	CBT and other therapies n/N	Therapeutic community n/N	Risk Ratio M-H, Fixed, 95% CI	Weight	Risk Ratio M-H, Fixed, 95% CI
5.4.1 New Subgroup					
Sacks 2008	49/163	48/151		100%	0.95[0.68,1.32]
Subtotal (95% CI)	**163**	**151**		**100%**	**0.95[0.68,1.32]**
Total events: 49 (CBT and other therapies), 48 (Therapeutic community)					
Heterogeneity: Not applicable					
Test for overall effect: Z=0.33(P=0.74)					
Total (95% CI)	**163**	**151**		**100%**	**0.95[0.68,1.32]**
Total events: 49 (CBT and other therapies), 48 (Therapeutic community)					
Heterogeneity: Not applicable					
Test for overall effect: Z=0.33(P=0.74)					



Analysis 5.5. Comparison 5 Cognitive behavioural therapy and other therapies versus prison therapeutic community, Outcome 5 Self-reported drug use at 6 months.

Study or subgroup	CBT and other therapies n/N	Therapeutic community n/N	Risk Ratio M-H, Random, 95% CI	Weight	Risk Ratio M-H, Random, 95% CI
Sacks 2008	36/163	39/151		100%	0.86[0.58,1.27]
Total (95% CI)	**163**	**151**		**100%**	**0.86[0.58,1.27]**
Total events: 36 (CBT and other therapies), 39 (Therapeutic community)					
Heterogeneity: Not applicable					
Test for overall effect: Z=0.78(P=0.44)					

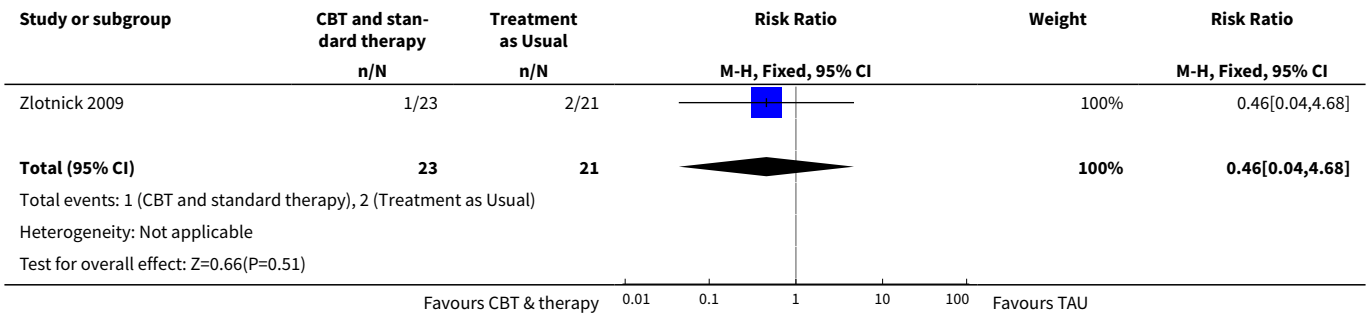
Analysis 5.6. Comparison 5 Cognitive behavioural therapy and other therapies versus prison therapeutic community, Outcome 6 Arrested (not parole violation) at 6 months.



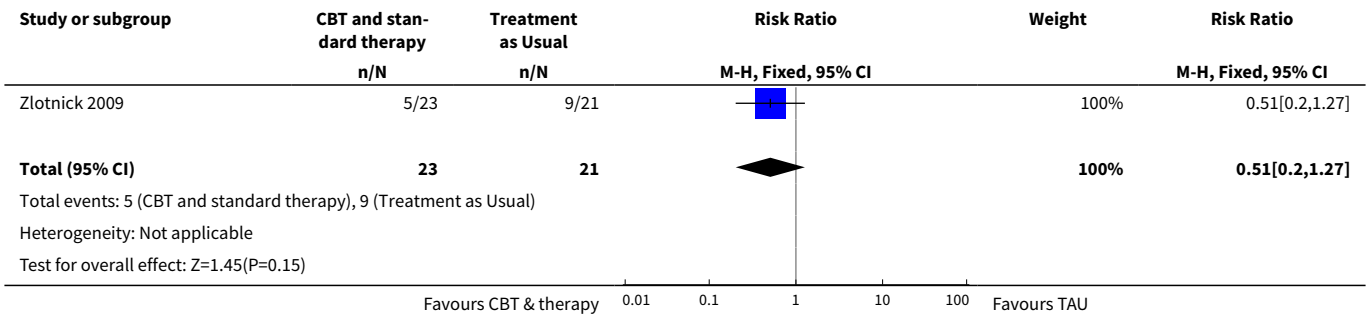
Comparison 6. Cognitive behavioural therapy and standard therapy versus treatment as usual

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Incarceration at 3 months	1	44	Risk Ratio (M-H, Fixed, 95% CI)	0.46 [0.04, 4.68]
2 Incarceration at 6 months	1	44	Risk Ratio (M-H, Fixed, 95% CI)	0.51 [0.20, 1.27]
3 ASI drug score at 3 months	1	44	Mean Difference (IV, Fixed, 95% CI)	0.02 [-0.05, 0.09]
4 ASI drug score at 6 months	1	44	Mean Difference (IV, Fixed, 95% CI)	-0.02 [-0.09, 0.05]

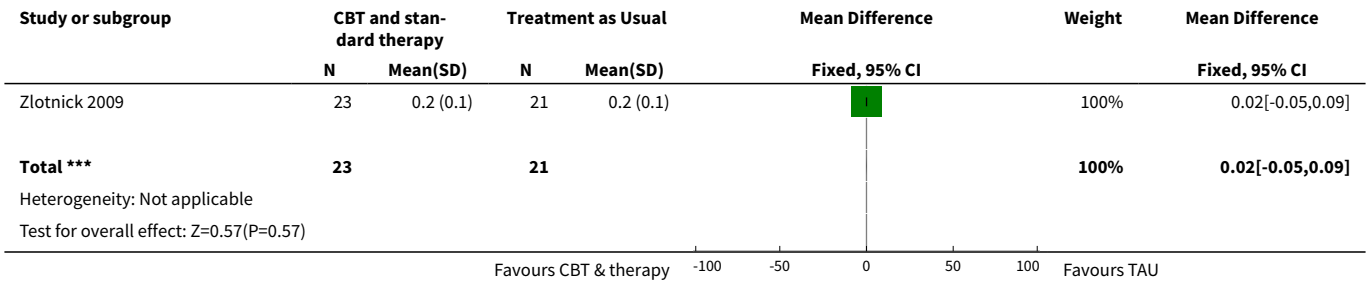
Analysis 6.1. Comparison 6 Cognitive behavioural therapy and standard therapy versus treatment as usual, Outcome 1 Incarceration at 3 months.



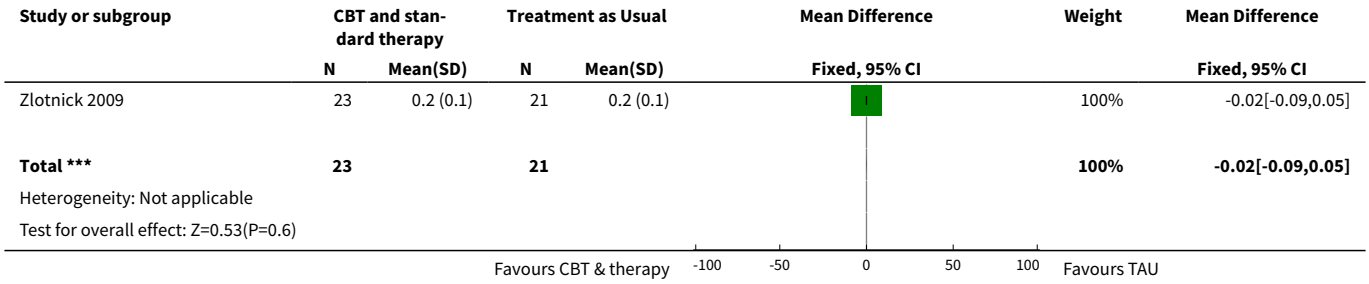
Analysis 6.2. Comparison 6 Cognitive behavioural therapy and standard therapy versus treatment as usual, Outcome 2 Incarceration at 6 months.



Analysis 6.3. Comparison 6 Cognitive behavioural therapy and standard therapy versus treatment as usual, Outcome 3 ASI drug score at 3 months.



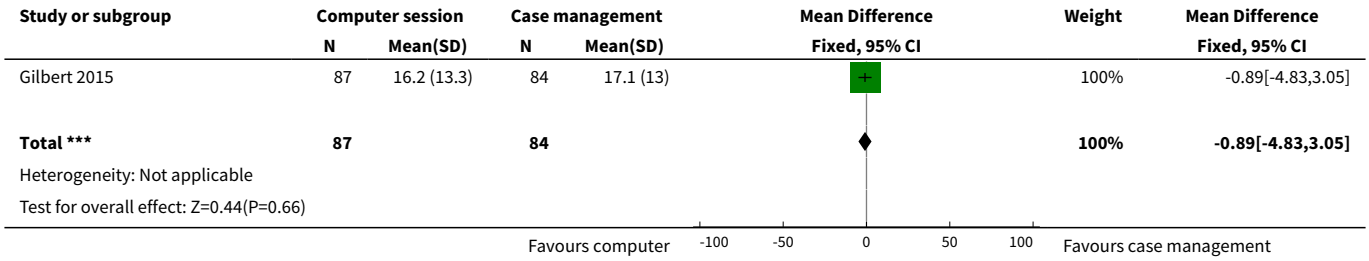
Analysis 6.4. Comparison 6 Cognitive behavioural therapy and standard therapy versus treatment as usual, Outcome 4 ASI drug score at 6 months.



Comparison 7. Single computerised session versus single session of case management

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Number of days not using drugs (in the past 30 days) at 3 months	1	171	Mean Difference (IV, Fixed, 95% CI)	-0.89 [-4.83, 3.05]

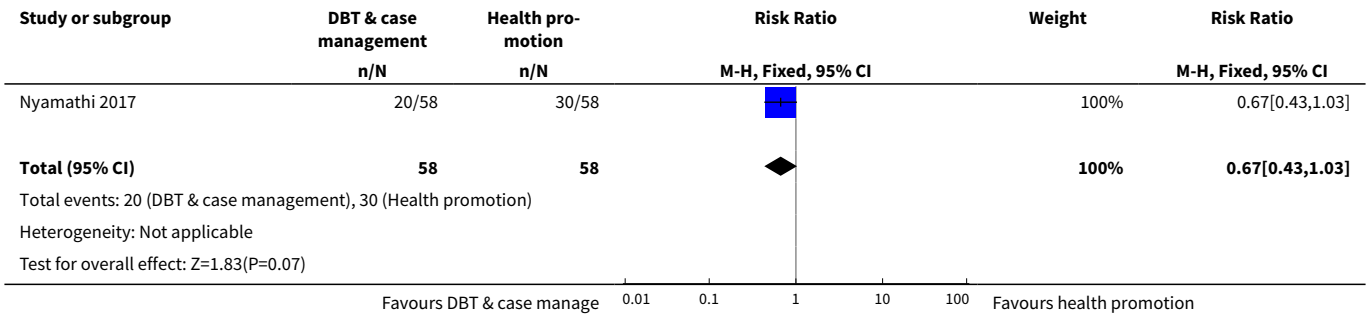
Analysis 7.1. Comparison 7 Single computerised session versus single session of case management, Outcome 1 Number of days not using drugs (in the past 30 days) at 3 months.



Comparison 8. Dialectic behaviour therapy and case management versus a health promotion scheme

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Positive drug test using urine sample at 6 months	1	116	Risk Ratio (M-H, Fixed, 95% CI)	0.67 [0.43, 1.03]
2 Number not using marijuana at 6 months	1	116	Risk Ratio (M-H, Fixed, 95% CI)	1.23 [0.95, 1.59]
3 Number not using crack at 6 months	1	116	Risk Ratio (M-H, Fixed, 95% CI)	1.0 [0.87, 1.14]
4 Number not using cocaine at 6 months	1	116	Risk Ratio (M-H, Fixed, 95% CI)	1.02 [0.93, 1.12]
5 Number not using heroin at 6 months	1	116	Risk Ratio (M-H, Fixed, 95% CI)	1.05 [0.98, 1.13]
6 Number not using methampheta-mine at 6 months	1	116	Risk Ratio (M-H, Fixed, 95% CI)	1.02 [0.87, 1.20]
7 Self-report of no drug use at 6 months	1	116	Risk Ratio (M-H, Fixed, 95% CI)	1.2 [0.92, 1.56]

Analysis 8.1. Comparison 8 Dialectic behaviour therapy and case management versus a health promotion scheme, Outcome 1 Positive drug test using urine sample at 6 months.



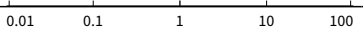
Analysis 8.2. Comparison 8 Dialectic behaviour therapy and case management versus a health promotion scheme, Outcome 2 Number not using marijuana at 6 months.

Study or subgroup	DBT & case management n/N	Health promotion n/N	Risk Ratio M-H, Fixed, 95% CI	Weight	Risk Ratio M-H, Fixed, 95% CI
Nyamathi 2017	43/58	35/58		100%	1.23[0.95,1.59]
Total (95% CI)	**58**	**58**		**100%**	**1.23[0.95,1.59]**
Total events: 43 (DBT & case management), 35 (Health promotion)					
Heterogeneity: Not applicable					
Test for overall effect: Z=1.56(P=0.12)					

Favours DBT & case manage — Favours health promotion

Analysis 8.3. Comparison 8 Dialectic behaviour therapy and case management versus a health promotion scheme, Outcome 3 Number not using crack at 6 months.

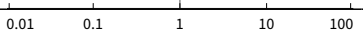
Study or subgroup	DBT & case management n/N	Health promotion n/N	Risk Ratio M-H, Fixed, 95% CI	Weight	Risk Ratio M-H, Fixed, 95% CI
Nyamathi 2017	51/58	51/58		100%	1[0.87,1.14]
Total (95% CI)	**58**	**58**		**100%**	**1[0.87,1.14]**
Total events: 51 (DBT & case management), 51 (Health promotion)					
Heterogeneity: Not applicable					
Test for overall effect: Not applicable					



Favours DBT & case manage — Favours health promotion

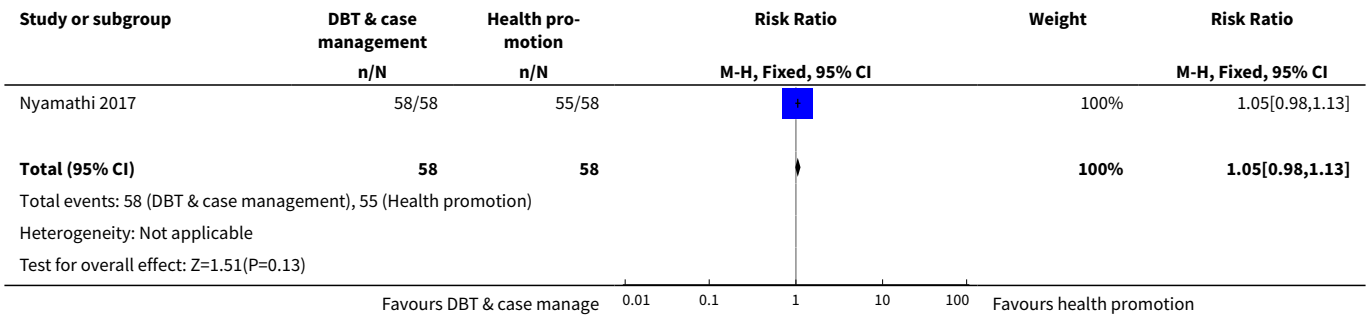
Analysis 8.4. Comparison 8 Dialectic behaviour therapy and case management versus a health promotion scheme, Outcome 4 Number not using cocaine at 6 months.

Study or subgroup	DBT & case management n/N	Health promotion n/N	Risk Ratio M-H, Fixed, 95% CI	Weight	Risk Ratio M-H, Fixed, 95% CI
Nyamathi 2017	55/58	54/58		100%	1.02[0.93,1.12]
Total (95% CI)	**58**	**58**		**100%**	**1.02[0.93,1.12]**
Total events: 55 (DBT & case management), 54 (Health promotion)					
Heterogeneity: Not applicable					
Test for overall effect: Z=0.39(P=0.7)					

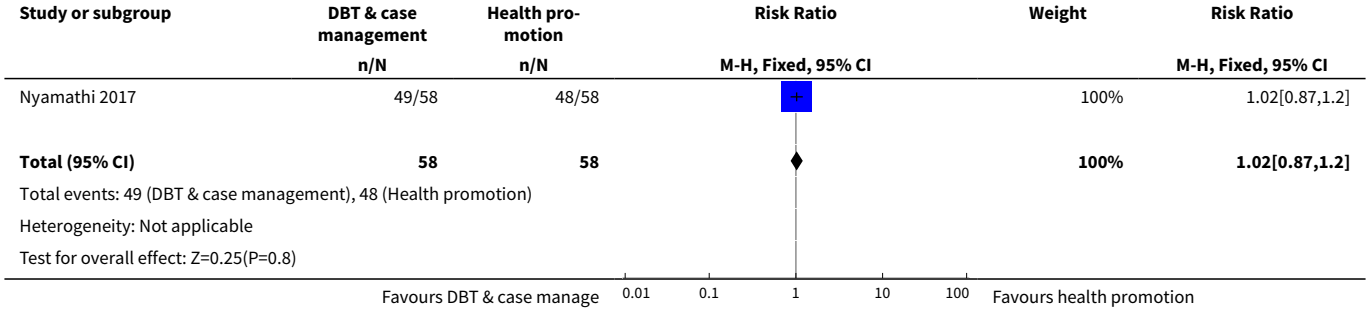


Favours DBT & case manage — Favours health promotion

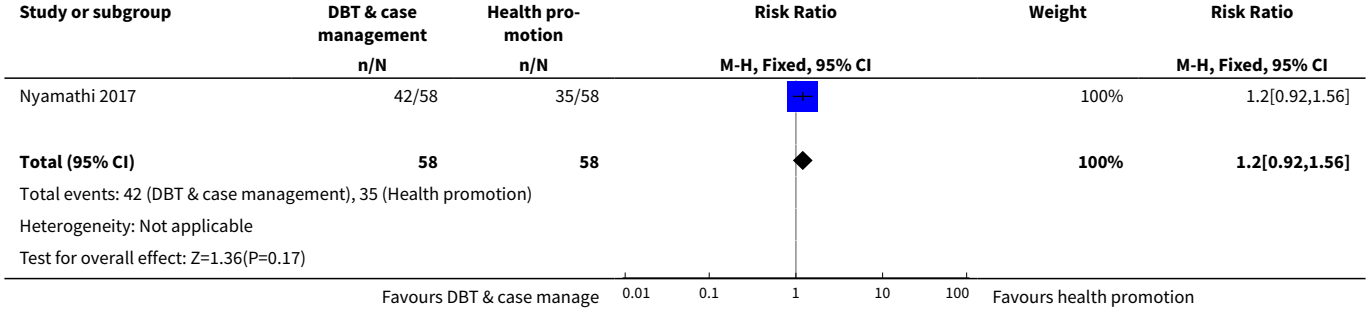
Analysis 8.5. Comparison 8 Dialectic behaviour therapy and case management versus a health promotion scheme, Outcome 5 Number not using heroin at 6 months.



Analysis 8.6. Comparison 8 Dialectic behaviour therapy and case management versus a health promotion scheme, Outcome 6 Number not using methamphetamine at 6 months.



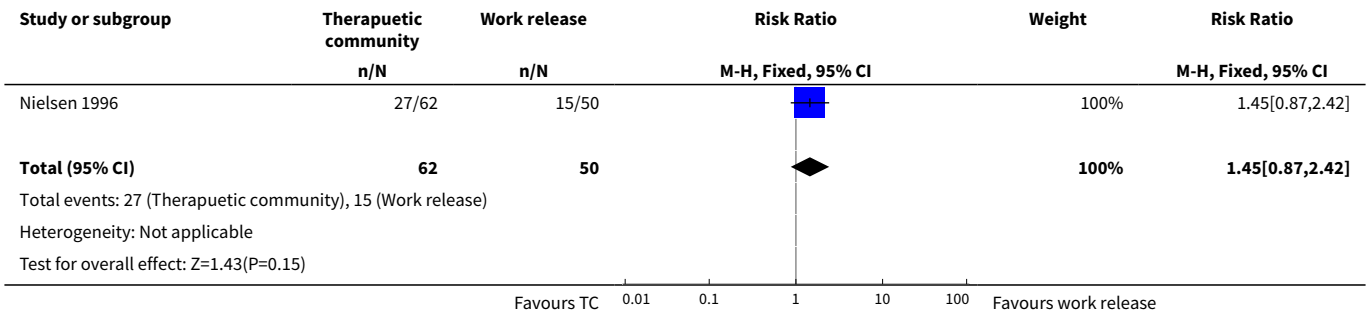
Analysis 8.7. Comparison 8 Dialectic behaviour therapy and case management versus a health promotion scheme, Outcome 7 Self-report of no drug use at 6 months.



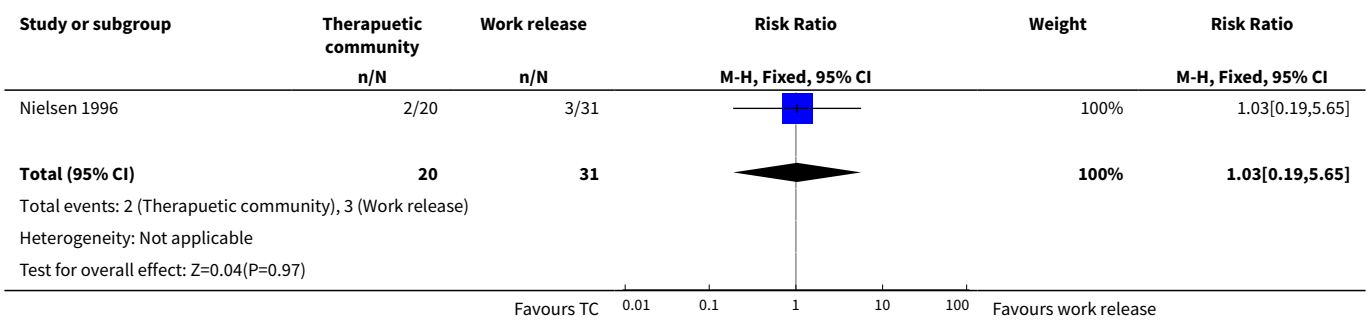
Comparison 9. Therapeutic community versus work release

Outcome or subgroup title	No. of studies	No. of partici-pants	Statistical method	Effect size
1 Incarcerated for drug offences at 18 months	1	112	Risk Ratio (M-H, Fixed, 95% CI)	1.45 [0.87, 2.42]
2 Marijuana use at 6 months	1	51	Risk Ratio (M-H, Fixed, 95% CI)	1.03 [0.19, 5.65]
3 Marijuana use at 18 months	1	28	Risk Ratio (M-H, Fixed, 95% CI)	1.0 [0.07, 14.45]
4 Heroin use at 6 months	1	68	Risk Ratio (M-H, Fixed, 95% CI)	1.59 [0.49, 5.14]
5 Heroin use at 18 months	1	37	Risk Ratio (M-H, Fixed, 95% CI)	1.92 [0.24, 15.37]
6 Crack use at 6 months	1	55	Risk Ratio (M-H, Fixed, 95% CI)	2.07 [0.41, 10.41]
7 Crack use at 18 months	1	34	Risk Ratio (M-H, Fixed, 95% CI)	1.64 [0.19, 14.06]
8 Cocaine use at 6 months	1	211	Risk Ratio (M-H, Fixed, 95% CI)	1.09 [0.79, 1.50]
9 Cocaine use at 18 months	1	139	Risk Ratio (M-H, Fixed, 95% CI)	0.93 [0.64, 1.35]

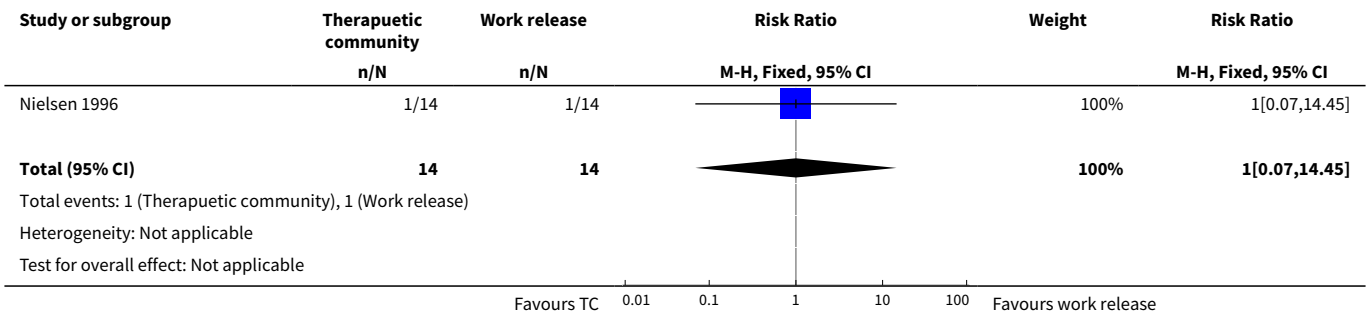
Analysis 9.1. Comparison 9 Therapeutic community versus work release, Outcome 1 Incarcerated for drug offences at 18 months.



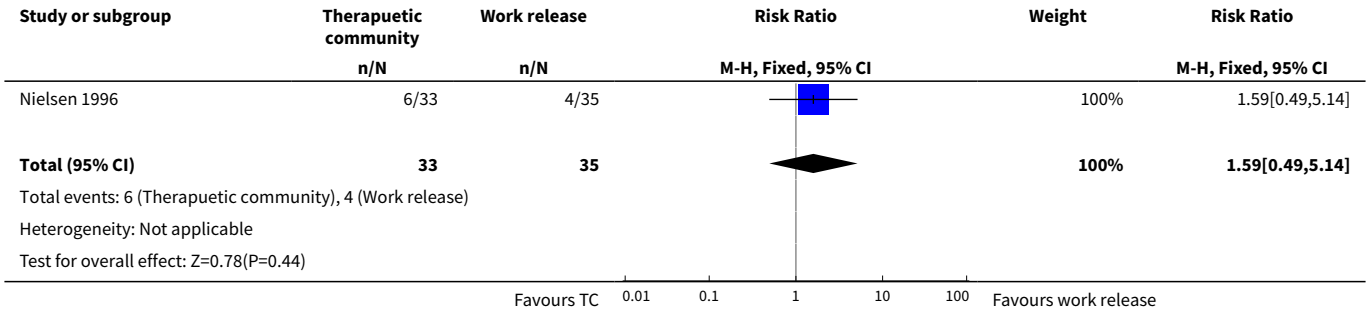
Analysis 9.2. Comparison 9 Therapeutic community versus work release, Outcome 2 Marijuana use at 6 months.



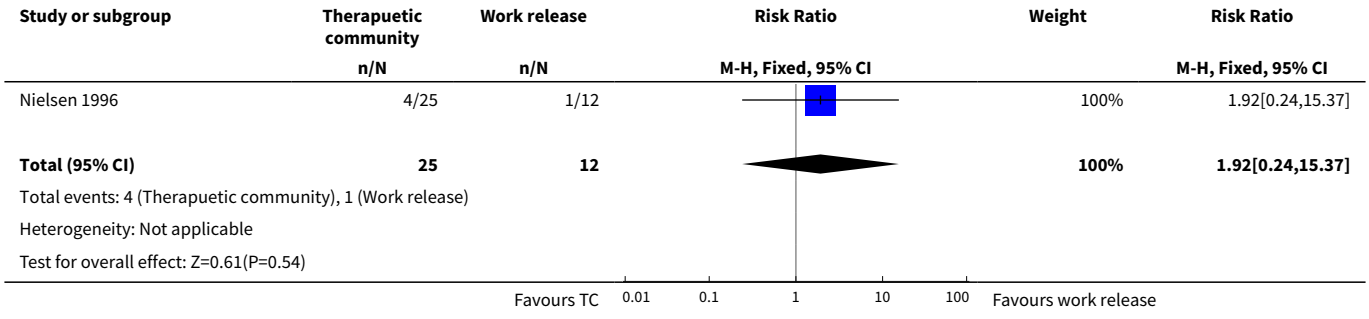
Analysis 9.3. Comparison 9 Therapuetic community versus work release, Outcome 3 Marijuana use at 18 months.



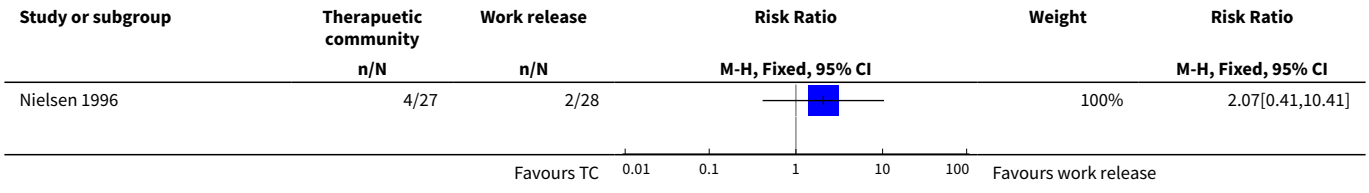
Analysis 9.4. Comparison 9 Therapuetic community versus work release, Outcome 4 Heroin use at 6 months.

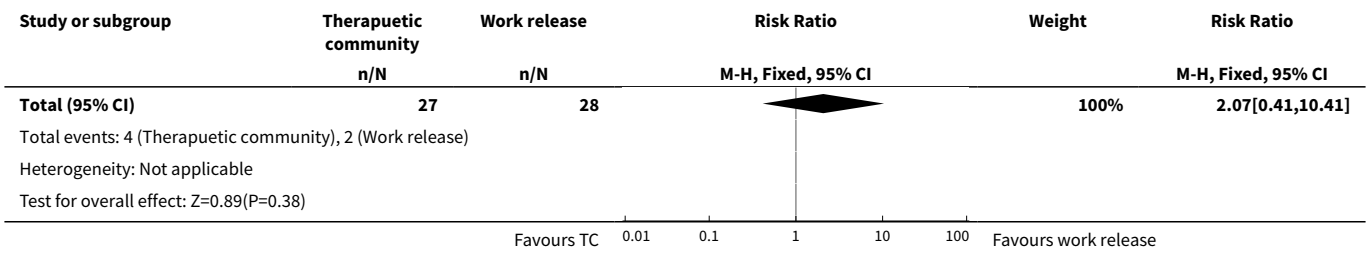


Analysis 9.5. Comparison 9 Therapuetic community versus work release, Outcome 5 Heroin use at 18 months.

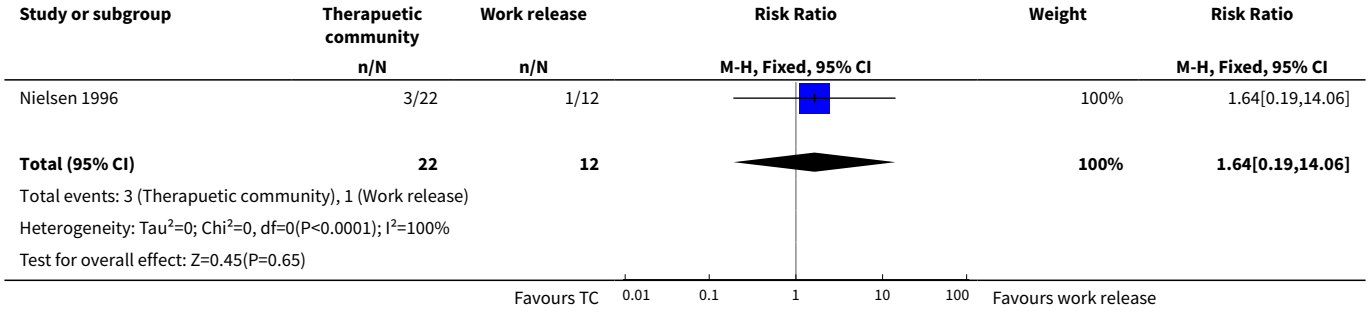


Analysis 9.6. Comparison 9 Therapuetic community versus work release, Outcome 6 Crack use at 6 months.

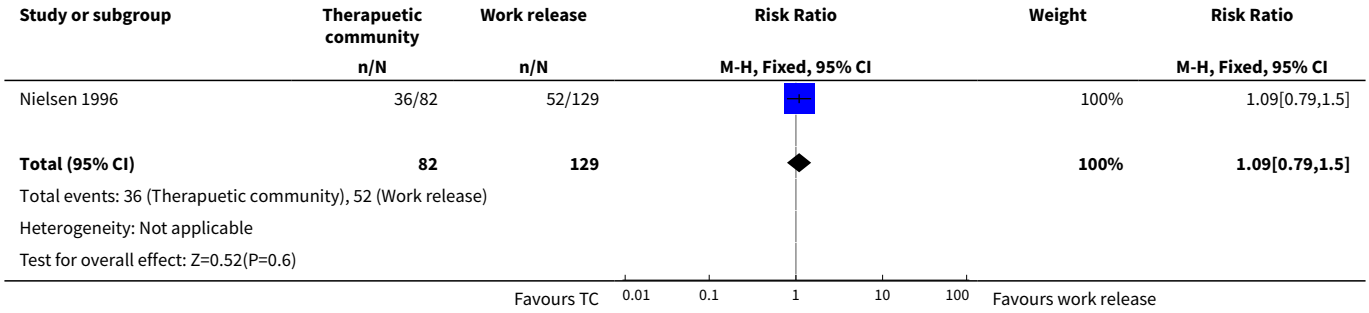




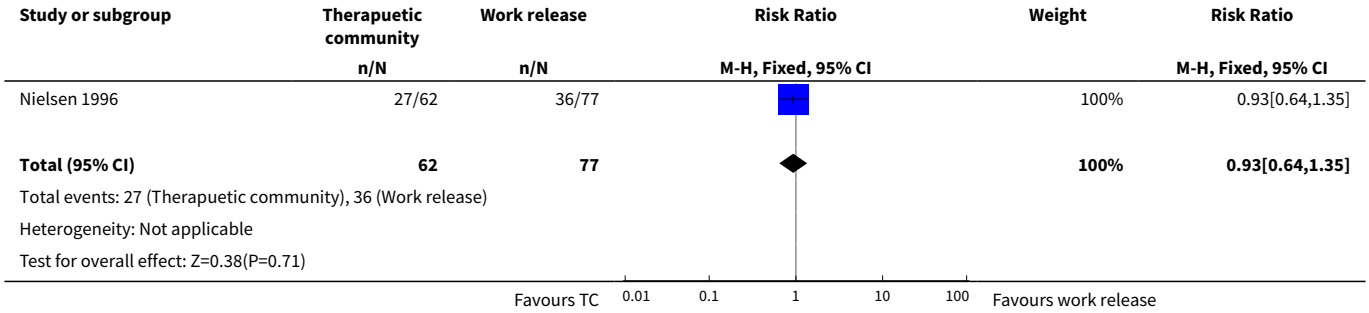
Analysis 9.7. Comparison 9 Therapeutic community versus work release, Outcome 7 Crack use at 18 months.



Analysis 9.8. Comparison 9 Therapeutic community versus work release, Outcome 8 Cocaine use at 6 months.



Analysis 9.9. Comparison 9 Therapeutic community versus work release, Outcome 9 Cocaine use at 18 months.



Comparison 10. Intensive discharge planning and case management versus prison only

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Marijuana use	1	511	Risk Ratio (M-H, Fixed, 95% CI)	0.79 [0.53, 1.16]
2 Hard drug use	1	511	Risk Ratio (M-H, Fixed, 95% CI)	1.12 [0.88, 1.43]
3 Positive hair test for crack cocaine	1	511	Odds Ratio (M-H, Fixed, 95% CI)	1.08 [0.75, 1.54]
4 Positive hair test for marijuana use	1	511	Risk Ratio (M-H, Fixed, 95% CI)	0.75 [0.55, 1.03]
5 Arrested	1	511	Risk Ratio (M-H, Fixed, 95% CI)	0.19 [0.04, 0.87]
6 Drug charge	1	511	Risk Ratio (M-H, Fixed, 95% CI)	1.07 [0.75, 1.53]
7 Incarceration	1	511	Risk Ratio (M-H, Fixed, 95% CI)	1.09 [0.86, 1.39]

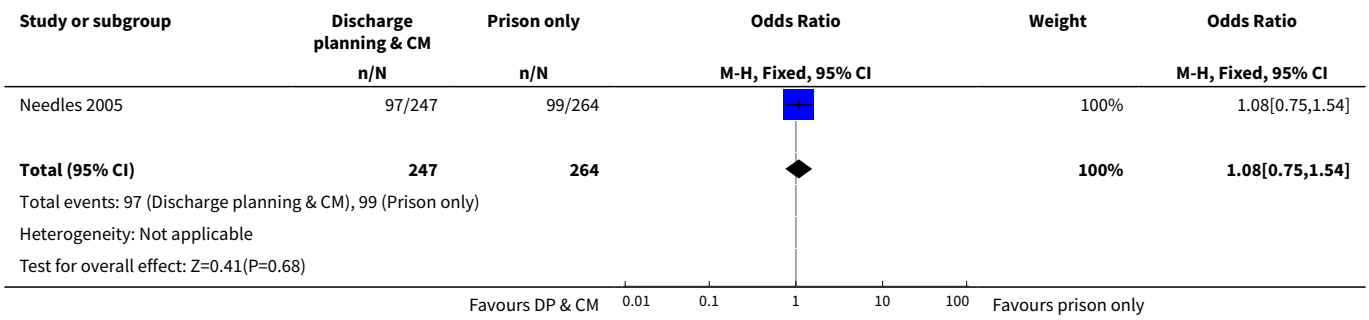
Analysis 10.1. Comparison 10 Intensive discharge planning and case management versus prison only, Outcome 1 Marijuana use.

Study or subgroup	Discharge planning & CM n/N	Jail only n/N	Risk Ratio M-H, Fixed, 95% CI	Weight	Risk Ratio M-H, Fixed, 95% CI
Needles 2005	36/247	49/264		100%	0.79[0.53,1.16]
Total (95% CI)	**247**	**264**		**100%**	**0.79[0.53,1.16]**
Total events: 36 (Discharge planning & CM), 49 (Jail only)					
Heterogeneity: Tau^2=0; Chi^2=0, df=0(P<0.0001); I^2=100%					
Test for overall effect: Z=1.2(P=0.23)					

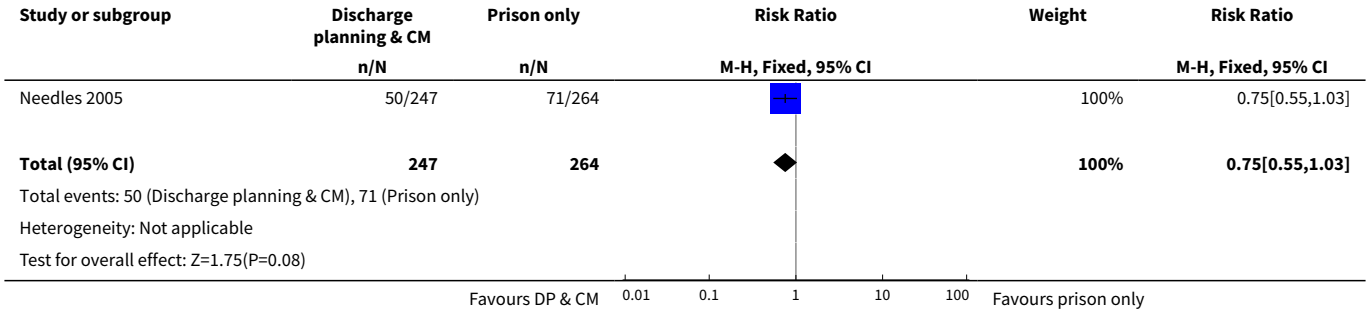
Analysis 10.2. Comparison 10 Intensive discharge planning and case management versus prison only, Outcome 2 Hard drug use.

Study or subgroup	Discharge planning & CM n/N	Jail only n/N	Risk Ratio M-H, Fixed, 95% CI	Weight	Risk Ratio M-H, Fixed, 95% CI
Needles 2005	87/247	83/264		100%	1.12[0.88,1.43]
Total (95% CI)	**247**	**264**		**100%**	**1.12[0.88,1.43]**
Total events: 87 (Discharge planning & CM), 83 (Jail only)					
Heterogeneity: Not applicable					
Test for overall effect: Z=0.91(P=0.36)					

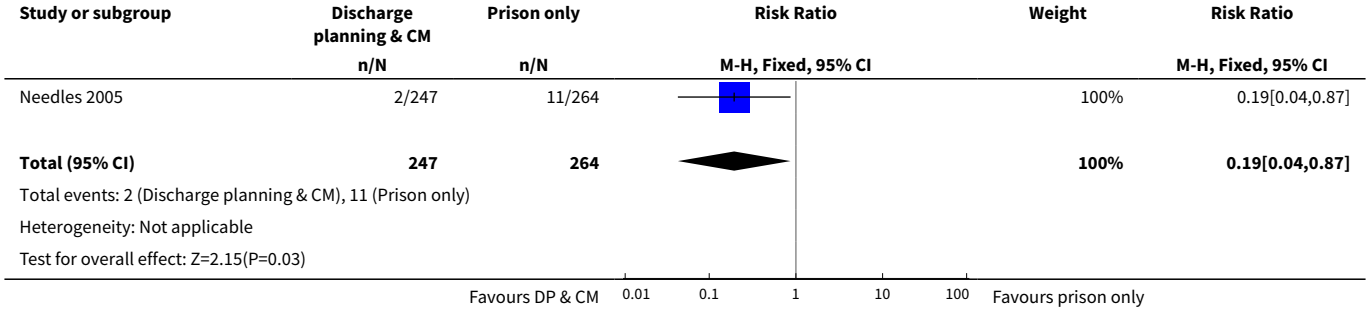
Analysis 10.3. Comparison 10 Intensive discharge planning and case management versus prison only, Outcome 3 Positive hair test for crack cocaine.



Analysis 10.4. Comparison 10 Intensive discharge planning and case management versus prison only, Outcome 4 Positive hair test for marijuana use.

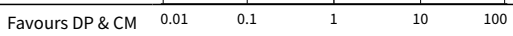


Analysis 10.5. Comparison 10 Intensive discharge planning and case management versus prison only, Outcome 5 Arrested.



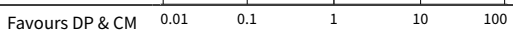
Analysis 10.6. Comparison 10 Intensive discharge planning and case management versus prison only, Outcome 6 Drug charge.

Study or subgroup	Discharge planning & CM n/N	Prison only n/N	Risk Ratio M-H, Fixed, 95% CI	Weight	Risk Ratio M-H, Fixed, 95% CI
Needles 2005	48/247	48/264		100%	1.07[0.75,1.53]
Total (95% CI)	**247**	**264**		**100%**	**1.07[0.75,1.53]**
Total events: 48 (Discharge planning & CM), 48 (Prison only)					
Heterogeneity: Not applicable					
Test for overall effect: Z=0.36(P=0.72)					



Analysis 10.7. Comparison 10 Intensive discharge planning and case management versus prison only, Outcome 7 Incarceration.

Study or subgroup	Discharge planning & CM n/N	Prison only n/N	Risk Ratio M-H, Fixed, 95% CI	Weight	Risk Ratio M-H, Fixed, 95% CI
Needles 2005	88/247	86/264		100%	1.09[0.86,1.39]
Total (95% CI)	**247**	**264**		**100%**	**1.09[0.86,1.39]**
Total events: 88 (Discharge planning & CM), 86 (Prison only)					
Heterogeneity: Not applicable					
Test for overall effect: Z=0.73(P=0.47)					



APPENDICES

Appendix 1. MEDLINE (R) Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Ovid MEDLINE(R) Daily and Ovid MEDLINE(R)

MEDLINE search
1 exp substance related disorders/ (274070)
2 street drugs/ (10355)
3 designer drugs/ (1439)
4 exp narcotics/ (120114)
5 ((substance$ or drug$ or narcotic$) adj2 (addict$ or depend$ or disorder$ or abuse$ or abusing or misuse$ or misusing or consumption$ or withdraw$ or withdraw$ or detox$)).ti,ab. (100176)
6 (mdma or alcohol$ or opiate$ or opioid$ or opium or heroin or methadone or cocaine or amphetamine$ or marijuana or cannabis or crack or phencyclidine).ti,ab. (491028)
7 1 or 2 or 3 or 4 or 5 or 6 (713470)
8 crime/ (15534)

(Continued)

9 criminals/ (4125)

10 prisoners/ (16035)

11 (justice system or remand$ or parole$ or probation or court$ or corrections or correctional or revocation).ti,ab. (56176)

12 (offend$ or criminal$ or convict$ or felon$).ti,ab. (37983)

13 (custody or custodial or gaol$ or jail$ or prison$ or incarcerat$ or inmate$).ti,ab. (29693)

14 (reoffend$ or reincarcerat$ or recidiv$ or ex-offender$).ti,ab. (5525)

15 8 or 9 or 10 or 11 or 12 or 13 or 14 (126620)

16 7 and 15 (16717)

17 randomized controlled trial.pt. (516039)

18 controlled clinical trial.pt. (101743)

19 randomized.ab. (453171)

20 placebo.ab. (210619)

21 drug therapy.fs. (2199170)

22 randomly.ab. (312199)

23 trial.ab. (477783)

24 groups.ab. (1925728)

25 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 (4548008)

26 exp animals/ not humans.sh. (4814392)

27 25 not 26 (3934677)

28 16 and 27 (3760)

29 (201404$ or 201405$ or 201406$ or 201407$ or 201408$ or 201409$ or 201410$ or 201411$ or 201412$).ed. (771773)

30 (2015$ or 2016$ or 2017$).ed. (3473901)

31 ("20180101" or "20180102" or "20180103" or "20180104" or "20180105").ed. (19503)

32 29 or 30 or 31 (4265177)

33 28 and 32 (822)

Appendix 2. Embase search strategy via Ovid

Embase search
1 substance abuse/ (49037)
2 drug dependence/ (46621)
3 addiction/ (49762)
4 drug abuse/ (49453)

(Continued)

5 intravenous drug abuse/ (9700)

6 opiate addiction/ (14284)

7 heroin dependence/ (8918)

8 cocaine dependence/ (11405)

9 morphine addiction/ (3077)

10 cannabis addiction/ (8306)

11 alcoholism/ (114191)

12 alcohol abuse/ (25949)

13 ((substance$ or drug$ or narcotic$) adj2 (addict$ or depend$ or disorder$ or abuse$ or abusing or misuse$ or misusing or consumption$ or withdraw$ or withdraw$ or detox$)).ti,ab. (122248)

14 (mdma or alcohol$ or opiate$ or opioid$ or opium or heroin or methadone or cocaine or amphetamine$ or marijuana or cannabis or crack or phencyclidine).ti,ab. (598185)

15 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 (773484)

16 exp crime/ (77511)

17 criminal behavior/ (7677)

18 criminal justice/ (5597)

19 prisoner/ or offender/ (25391)

20 (justice system or remand$ or parole$ or probation or court$ or corrections or correctional or revocation).ti,ab. (56577)

21 (offend$ or criminal$ or convict$ or felon$).ti,ab. (44660)

22 (custody or custodial or gaol$ or jail$ or prison$ or incarcerat$ or inmate$).ti,ab. (32476)

23 (reoffend$ or reincarcerat$ or recidiv$ or ex-offender$).ti,ab. (6561)

24 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 (186404)

25 clinical trial/ (968061)

26 randomized controlled trial/ (482319)

27 randomization/ (76536)

28 single blind procedure/ (30101)

29 double blind procedure/ (145050)

30 crossover procedure/ (53840)

31 placebo/ (316535)

32 randomi?ed controlled trial$.tw. (170107)

33 rct.tw. (26496)

34 random allocation.tw. (1760)

35 randomly allocated.tw. (28885)

36 allocated randomly.tw. (2297)

37 (allocated adj2 random).tw. (874)

(Continued)

38 single blind$.tw. (20390)

39 double blind$.tw. (184823)

40 ((treble or triple) adj blind$).tw. (751)

41 placebo$.tw. (265371)

42 prospective study/ (415317)

43 or/25-42 (1860599)

44 case study/ (51268)

45 case report.tw. (353058)

46 abstract report/ or letter/ (1036148)

47 or/44-46 (1432272)

48 43 not 47 (1813215)

49 15 and 24 and 48 (1488)

50 ("201400" or "201500" or "201600" or "201701" or "201801" or "201802" or "201803").em. (28088822)

51 49 and 50 (1190)

Appendix 3. PsycInfo search strategy

PsycInfo
1 Addiction/ (9382)
2 Drug dependency/ (12153)
3 Drug Usage/ (16822)
4 Drug Abuse/ (44051)
5 Alcohol Abuse/ (16779)
6 Alcohol rehabiliation/ or drug rehabilitation/ (19802)
7 ((substance$ or drug$ or narcotic$) adj2 (addict$ or depend$ or disorder$ or abuse$ or abusing or misuse$ or misusing or consumption$ or withdraw$ or withdraw$ or detox$)).ti,ab. (74728)
8 (mdma or alcohol$ or opiate$ or opioid$ or opium or heroin or methadone or cocaine or amphetamine$ or marijuana or cannabis or crack or phencyclidine).ti,ab. (176992)
9 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 (241511)
10 crime/ (14125)
11 criminal behavior/ (8381)
12 recidivism/ (5324)
13 prisoners/ or prisons/ or incarceration/ (16728)
14 probation/ or parole/ (1864)

(Continued)

15 criminals/ or female criminals/ or male delinquency/ or juvenile delinquency/ (30689)

16 (justice system or remand$ or parole$ or probation or court$ or corrections or correctional or revocation).ti,ab. (53371)

17 (offend$ or criminal$ or convict$ or felon$).ti,ab. (69723)

18 (custody or custodial or gaol$ or jail$ or prison$ or incarcerat$ or inmate$).ti,ab. (37348)

19 (reoffend$ or reincarcerat$ or recidiv$ or ex-offender$).ti,ab. (8414)

20 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 (142208)

21 (empirical study or treatment outcome clinical trial).md. (2237461)

22 (random$ adj4 trial$).ti,ab. (44037)

23 Placebo/ (5050)

24 (random* or sham or placebo*).ti,ab,hw. (203386)

25 ((singl* or doubl*) adj (blind* or dumm* or mask*)).ti,ab,hw. (23778)

26 21 or 22 or 23 or 24 or 25 (2291604)

27 9 and 20 and 26 (11242)

28 (201404$ or 201405$ or 201406$ or 201407$ or 201408$ or 201409$ or 201410$ or 201411$ or 201412$).up. (164403)

29 (2015$ or 2016$ or 2017$).up. (645836)

30 "20180101".up. (957)

31 28 or 29 or 30 (811196)

32 27 and 31 (2333)

Appendix 4. PASCAL. SciSearch, Social SciSSciSearch, Wilson Applied Science and Technology Abstracts search strategy

PASCAL search
#1TOPIC: (substance* NEAR/2 (addict* or depend* or disorder* or abuse* or abusing or misuse* or misusing or consumption* or withdraw* or withdraw* or detox*)) OR TOPIC: (drug* NEAR/2 (addict* or depend* or disorder* or abuse* or abusing or misuse* or misusing or consumption* or withdraw* or withdraw* or detox*)) OR TOPIC: (narcotic* NEAR/2 (addict* or depend* or disorder* or abuse* or abusing or misuse* or misusing or consumption* or withdraw* or withdraw* or detox*)) DocType=All document types; Language=All languages; #2TOPIC: (mdma or alcohol* or opiate* or opioid* or opium or heroin or methadone or cocaine or amphetamine* or marijuana or cannabis or crack or phencyclidine) DocType=All document types; Language=All languages; #3#2 OR #1 DocType=All document types; Language=All languages; #4TOPIC: ("justice system" or remand* or parole* or probation or court* or corrections or correctional or revocation) OR TOPIC: (crime or criminal or offender* or criminal* or convict* or felon*) OR TOPIC: (custody or custodial or gaol* or jail* or prison* or incarcerat* or inmate*) OR TOPIC: (reoffend* or reincarcerat* or recidiv* or ex-offender*) DocType=All document types; Language=All languages; #5#4 AND #2 DocType=All document types; Language=All languages;

Appendix 5. The CENTRAL Register of Controlled trials search strategy via Cochrane Library

CENTRAL search
#1 MeSH descriptor: [Substance-Related Disorders] explode all trees
#2 MeSH descriptor: [Street Drugs] explode all trees
#3 MeSH descriptor: [Designer Drugs] explode all trees
#4 MeSH descriptor: [Narcotics] explode all trees
#5 (substance* or drug* or narcotic*) near/2 (addict* or depend* or disorder* or abuse* or abusing or misuse* or misusing or consumption* or withdraw$ or withdraw* or detox*):ti,ab,kw (Word variations have been searched)
#6 mdma or alcohol* or opiate* or opioid* or opium or heroin or methadone or cocaine or amphetamine* or marijuana or cannabis or crack or phencyclidine:ti,ab,kw (Word variations have been searched)
#7 #1 or #2 or #3 or #4 or #5 or #6
#8 MeSH descriptor: [Crime] explode all trees
#9 MeSH descriptor: [Criminals] explode all trees
#10 MeSH descriptor: [Prisoners] explode all trees
#11 (justice system) or remand* or parole* or probation or court* or corrections or correctional or revocation:ti,ab,kw (Word variations have been searched)
#12 custody or custodial or gaol* or jail* or prison* or incarcerat* or inmate*:ti,ab,kw (Word variations have been searched)
#13 reoffend* or reincarcerat* or recidiv* or ex-offender*:ti,ab,kw (Word variations have been searched)
#14 offend* or criminal* or convict* or felon:ti,ab,kw (Word variations have been searched)
#15 #8 or #9 or #10 or #11 or #12 or #13 or #14
#16 #7 and #15

Appendix 6. ASSIA search strategy

ASSIA search
(ti(substance* NEAR/2 (addict* OR depend* OR disorder* OR abuse* OR abusing OR misuse* OR misusing OR consumption* OR withdraw* OR withdraw* OR detox*)) OR ab(substance* NEAR/2 (addict* OR depend* OR disorder* OR abuse* OR abusing OR misuse* OR misusing OR consumption* OR withdraw* OR withdraw* OR detox*)) OR ti(drug* NEAR/2 (addict* OR depend* OR disorder* OR abuse* OR abusing OR misuse* OR misusing OR consumption* OR withdraw* OR withdraw* OR detox*)) OR ab(drug* NEAR/2 (addict* OR depend* OR disorder* OR abuse* OR abusing OR misuse* OR misusing OR consumption* OR withdraw* OR withdraw* OR detox*)) OR ti(narcotic* NEAR/2 (addict* OR depend* OR disorder* OR abuse* OR abusing OR misuse* OR misusing OR consumption* OR withdraw* OR withdraw* OR detox*)) OR ab(narcotic* NEAR/2 (addict* OR depend* OR disorder* OR abuse* OR abusing OR misuse* OR misusing OR consumption* OR withdraw* OR withdraw* OR detox*)) OR ti(mdma OR alcohol* OR opiate* OR opioid* OR opium OR heroin OR methadone OR cocaine OR amphetamine* OR marijuana OR cannabis OR crack OR phencyclidine) OR ab(mdma OR alcohol* OR opiate* OR opioid* OR opium OR heroin OR methadone OR cocaine OR amphetamine* OR marijuana OR cannabis OR crack OR phencyclidine)) AND (ti((justice system) OR remand* OR parole* OR probation OR court* OR corrections OR correctional OR revocation) OR ab((justice system) OR remand* OR parole* OR probation OR court* OR corrections OR correctional OR revocation) OR ti(crime OR offend* OR criminal OR convict* OR felon*) OR ab(crime OR offend* OR criminal* OR convict* OR felon*) OR ti(custody OR custodial OR gaol* OR jail* OR prison* OR incarcerat* OR inmate*) OR ab(custody OR custodial OR gaol* OR jail* OR prison* OR incar-

(Continued)
cerat*or inmate*) OR ti(reoffend* OR reincarcerat* OR recidiv* OR ex-offender*) OR ab(reoffend* OR reincarcerat* OR recidiv* OR ex-offender*)).

Appendix 7. Health Management Information Consortium (HMIC) search strategy via Ovid

HMIC
1 designer drugs/ (6)
2 exp narcotics/ (365)
3 ((substance$ or drug$ or narcotic$) adj2 (addict$ or depend$ or disorder$ or abuse$ or abusing or misuse$ or misusing or consumption$ or withdraw$ or withdraw$ or detox$)).ti,ab. (3032)
4 (mdma or alcohol$ or opiate$ or opioid$ or opium or heroin or methadone or cocaine or amphetamine$ or marijuana or cannabis or crack or phencyclidine).ti,ab. (6910)
5 1 or 2 or 3 or 4 (9003)
6 crime/ (450)
7 prisoners/ (652)
8 (justice system or remand$ or parole$ or probation or court$ or corrections or correctional or revocation).ti,ab. (3327)
9 (offend$ or criminal$ or convict$ or felon$).ti,ab. (2875)
10 (custody or custodial or gaol$ or jail$ or prison$ or incarcerat$ or inmate$).ti,ab. (2332)
11 (reoffend$ or reincarcerat$ or recidiv$ or ex-offender$).ti,ab. (105)
12 6 or 7 or 8 or 9 or 10 or 11 (7118)
13 5 and 12 (634)
14 limit 13 to yr="2014 -Current" (14)

Appendix 8. PAIS search strategy

PAIS
(ti(substance* NEAR/2 (addict* OR depend* OR disorder* OR abuse* OR abusing OR misuse* OR misusing OR consumption* OR withdraw* OR withdraw* OR detox*)) OR ab(substance* NEAR/2 (addict* OR depend* OR disorder* OR abuse* OR abusing OR misuse* OR misusing OR consumption* OR withdraw* OR withdraw* OR detox*)) OR ti(drug* NEAR/2 (addict* OR depend* OR disorder* OR abuse* OR abusing OR misuse* OR misusing OR consumption* OR withdraw* OR withdraw* OR detox*)) OR ab(drug* NEAR/2 (addict* OR depend* OR disorder* OR abuse* OR abusing OR misuse* OR misusing OR consumption* OR withdraw* OR withdraw* OR detox*)) OR ti(narcotic* NEAR/2 (addict* OR depend* OR disorder* OR abuse* OR abusing OR misuse* OR misusing OR consumption* OR withdraw* OR withdraw* OR detox*)) OR ab(narcotic* NEAR/2 (addict* OR depend* OR disorder* OR abuse* OR abusing OR misuse* OR misusing OR consumption* OR withdraw* OR withdraw* OR detox*)) OR ti(mdma OR alcohol* OR opiate* OR opioid* OR opium OR heroin OR methadone OR cocaine OR amphetamine* OR marijuana OR cannabis OR crack OR phencyclidine) OR ab(mdma OR alcohol* OR opiate* OR opioid* OR opium OR heroin OR methadone OR cocaine OR amphetamine* OR marijuana OR cannabis OR crack OR phencyclidine)) AND (ti((justice system) OR remand* OR parole* OR probation OR court* OR corrections OR correctional OR revocation) OR ab((justice system) OR remand* OR parole* OR probation OR court* OR corrections OR correctional OR revocation) OR ti(crime OR offend* OR criminal OR convict* OR felon*) OR ab(crime OR offender* OR criminal* OR convict* OR felon*) OR ti(custody OR custodial OR gaol* OR jail* OR prison* OR incarcerat* OR inmate*) OR ab(custody OR custodial OR gaol* OR jail* OR prison* OR in-

(Continued)
carcerat*or inmate*) OR ti(reoffend* OR reincarcerat* OR recidiv* OR ex-offender*) OR ab(reoffend* OR reincarcerat* OR recidiv* OR ex-offender*))

Appendix 9. Criminal Justice Abstracts search strategy

CJA search

S1
TI (substance* N2 (addict* or depend* or disorder* or abuse* or abusing or misuse* or misusing or consumption* or withdraw* or withdraw* or detox*)) OR AB (substance* N2 (addict* or depend* or disorder* or abuse* or abusing or misuse* or misusing or consumption* or withdraw* or withdraw* or detox*)) OR TI (drug* N2 (addict* or depend* or disorder* or abuse* or abusing or misuse* or misusing or consumption* or withdraw* or withdraw* or detox*)) OR AB (drug* N2 (addict* or depend* or disord ...
Search modes - Boolean/Phrase

S2
TI (mdma or alcohol* or opiate* or opioid* or opium or heroin or methadone or cocaine or amphetamine* or marijuana or cannabis or crack or phencyclidine) OR AB (mdma or alcohol* or opiate* or opioid* or opium or heroin or methadone or cocaine or amphetamine* or marijuana or cannabis or crack or phencyclidine)
Search modes - Boolean/Phrase

S3
S1 OR S2
Search modes - Boolean/Phrase

S4
TI (justice system) or crime or remand* or parole* or probation or court* or corrections or correctional or revocation) OR AB (justice system) or crime or remand* or parole* or probation or court* or corrections or correctional or revocation) OR TI (offend* or criminal* or convict* or felon*) OR AB (offend* or criminal* or convict* or felon*) OR TI (custody or custodial or gaol* or jail* or prison* or incarcerat* or inmate*) OR AB (custody or custodial or gaol* or jail* or prison* or ...
Search modes - Boolean/Phrase

S5
S3 AND S4

Appendix 10. LILACS

LILACS search (via http://lilacs.bvsalud.org/en/).

tw:((remand or prison or prisoner or prisoners or prisão or cárcere or cárcel or detenidos or detentas or acusados or presidiáriossobre or presidiarias or preso or Privados or recluses or offender$ or infratoras or infratora or infratores or delicuentes or infrator or criminal$ or probation or probatorio or estagio or court or courts or tribunal or tribunals or secure establishment$ or secure facilit$ or reoffend$ or reincarcerat$ or recidivi$ or reincidencia or recidivante or reincidência or ex-offender$ or jail or jails or gaol or gaols or incarcerat$ or encarcerados or covict or convicts or convicted or felon or felons or conviction$ or reconviction$ or Convicções or convicciones or inmate$ or internos or high security or prisoners or law enforcement or jurisprudence))) AND (tw:((Substance abuse$ or substance misuse$ or substance use$ or usuários de substâncias or drug dependanc$ or drug abuse$ or drug use$ or drug misuse$ or drug addict$ or narcotics addict$ or narcotics use$ or narcotics misuse$ or narcotics abuse$ or chemical dependenc$ or opiates or heroin or crack or cocaine or amphetamines or cocaine or heroína or opioides or anfetaminas or opiáceos or opióides or addiction or adicción or adicciones or dependência or farmacodependente or adición or adição or dependence disorder$ or drug involved or Substance-related disorders or amphetamine-related disorders or cocaine-related disorders or marijuana abuse or opioid-related disorders or phencyclidine abuse or substance abuse intravenous or street drugs or designer drugs or cocaine or amphetamines or analgesics)))

Appendix 11. CINHAL Plus

S1	TI (substance* N2 (addict* or depend* or disorder* or abuse* or abusing or misuse* or misusing or consumption* or withdraw* or withdraw* or detox*)) OR AB (substance* N2 (addict* or depend* or disorder* or abuse* or abusing or misuse* or misusing or consumption* or withdraw* or withdraw* or detox*)) OR TI (drug* N2 (addict* or depend* or disorder* or abuse* or abusing or misuse* or misusing or consumption* or withdraw* or withdraw* or detox*)) OR AB (drug* N2 (addict* or depend* or disord ...
S2	TI (mdma or alcohol* or opiate* or opioid* or opium or heroin or methadone or cocaine or amphetamine* or marijuana or cannabis or crack or phencyclidine) OR AB (mdma or alcohol* or opiate* or opioid* or opium or heroin or methadone or cocaine or amphetamine* or marijuana or cannabis or crack or phencyclidine)
S3	S1 OR S2
S4	TI (justice system) or crime or remand* or parole* or probation or court* or corrections or correctional or revocation) OR AB (justice system) or crime or remand* or parole* or probation or court* or corrections or correctional or revocation) OR TI (offend* or criminal* or convict* or felon*) OR AB (offend* or criminal* or convict* or felon*) OR TI (custody or custodial or gaol* or jail* or prison* or incarcerat* or inmate*) OR AB (custody or custodial or gaol* or jail* or prison* or ...
S5	S3 AND S4

Appendix 12. Criteria for 'Risk of bias' assessment

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 one 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 one of the following methods 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 non opaque or not sequentially numbered); alternation or rotation; date of birth; case record number; any other explicitly unconcealed procedure.

(Continued)

	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 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;

(Continued)

		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 participants 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 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 prespecified (primary and secondary) outcomes that are of interest in the review have been reported in the prespecified way; The study protocol is not available but it is clear that the published reports include all expected outcomes, including those that were prespecified (convincing text of this nature may be uncommon).
	High risk	Not all of the study's prespecified primary outcomes have been reported; One or more primary outcomes is reported using measurements, analysis methods or subsets of the data (e.g. subscales) that were not prespecified; One or more reported primary outcomes were not prespecified (unless clear justification for their reporting is provided, such as an unexpected adverse effect); One 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 intention-to-treat analysis or evidence of missing data. Concerns of attrition and measurement error including reliance on self-reported measures.
	Unclear risk	Insufficient information to permit judgement of low or high risk.

WHAT'S NEW

Date	Event	Description
6 February 2019	New search has been performed	This update represents an additional three trials; bringing the total number of trials in this review to 13. The search strategies are complete up until February 2019. The 13 trials represent 2560 participants and 15 publications.
6 February 2019	New citation required and conclusions have changed	Conclusions changed

HISTORY

Review first published: Issue 1, 2014

Date	Event	Description
18 May 2015	New citation required and conclusions have changed	Conclusions are quite different for some outcomes
11 July 2014	New search has been performed	This update represents an additional three trials; bringing the total number of trials in this review to nine. The search strategies are complete up until May 2014.
24 January 2014	Amended	Plain language summary title correction
28 May 2013	New search has been performed	This review has been updated using searches to 21 March 2013. This review represents one in a family of four reviews. The other three reviews cover pharmacological and non-pharmacological interventions for drug using offenders and interventions for drug-using offenders with co-occurring mental illness. This review on drug-using female offenders concerns a total of 11 new randomised controlled trials, representing 1236 participants.
2 March 2012	New search has been performed	The updated edit of this review produced a new document with additional findings with searches up to 11 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
19 May 2006	New citation required and conclusions have changed	Substantive amendment

CONTRIBUTIONS OF AUTHORS

Searches were constructed and conducted by KW. The independent review team inspected the search hits by reading the titles and abstracts. Each potentially relevant study located in the search was obtained as a full article and was independently assessed for inclusion by the review team. In the case of discordance, a third independent review author arbitrated. Where it was not possible to evaluate the study because of language problems or missing information, the studies were classified as 'translation/information required to determine

decision' until a translation or further details were provided. The team of reviewers conducted data extraction for the papers. The results were compiled and organised by AEP, LB and CH, the review team and all authors contributed towards the final draft text.

DECLARATIONS OF INTEREST

- Amanda E Perry has no interests to declare relating to this work.
- Marrissa Martyn-St James has no interests to declare relating to this work.
- Lucy Burns has no interests to declare relating to this work.
- Catherine Hewitt has no interests to declare relating to this work.
- Julie M Glanville has no interests to declare relating to this work.
- Anne Aboaja has no interests to declare relating to this work.
- Pratish Thakkar has no interests to declare relating to this work.
- Santosh Kumar has no interests to declare relating to this work.
- Caroline Pearson has no interests to declare relating to this work.
- Kath Wright has no interests to declare relating to this work.

SOURCES OF SUPPORT

Internal sources

- Reviewer from Cochrane Drugs and Alcohol Group, Other.

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

External sources

- The UK Department of Health funded the original review, UK.
- National Institute for Health Research (NIHR), UK.

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DIFFERENCES BETWEEN PROTOCOL AND REVIEW

We have split the original review, Perry 2006, into different reviews (Perry 2015a; Perry 2015b; Perry 2019), and so there is no dedicated protocol for this particular review. We had planned to perform a sensitivity analysis, excluding studies at high risk of bias, however, we could not conduct a subgroup analysis because we did not perform a meta-analysis due to the heterogeneity in the types of intervention compared.

We assessed performance bias in only one trial. We decided to limit our search for this update on studies on effectiveness, because we verified from the previous updates that the data on cost and cost-effectiveness are too sparse and heterogeneous to provide any meaningful information.

INDEX TERMS

Medical Subject Headings (MeSH)

Buprenorphine [therapeutic use]; Case Management; Cognitive Behavioral Therapy; Crime [*prevention & control]; Criminals; Law Enforcement; Narcotic Antagonists [therapeutic use]; Randomized Controlled Trials as Topic; Sex Factors; Substance-Related Disorders [*therapy]; Therapeutic Community

MeSH check words

Female; Humans