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[Intervention Review]

Psychosocial interventions for stimulant use disorder

Silvia Minozzi[1], Rosella Saulle[1], Laura Amato[1], Francesco Traccis[2], Roberta Agabio[2]

[1]Department of Epidemiology, Lazio Regional Health Service, Rome, Italy. [2]Department of Biomedical Sciences, Section of Neuroscience and Clinical Pharmacology, University of Cagliari, Cagliari, Italy

Contact: Silvia Minozzi, s.minozzi@deplazio.it.

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ABSTRACT

Background

Stimulant use disorder is a continuously growing medical and social burden without approved medications available for its treatment. Psychosocial interventions could be a valid approach to help people reduce or cease stimulant consumption. This is an update of a Cochrane review first published in 2016.

Objectives

To assess the efficacy and safety of psychosocial interventions for stimulant use disorder in adults.

Search methods

We searched the Cochrane Drugs and Alcohol Group Specialised Register, Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, Embase, three other databases, and two trials registers in September 2023. All searches included non-English language literature. We handsearched the references of topic-related systematic reviews and the included studies.

Selection criteria

We included randomised controlled trials (RCTs) comparing any psychosocial intervention with no intervention, treatment as usual (TAU), or a different intervention in adults with stimulant use disorder.

Data collection and analysis

We used the standard methodological procedures expected by Cochrane.

Main results

We included a total of 64 RCTs (8241 participants). Seventy-three percent of studies included participants with cocaine or crack cocaine use disorder; 3.1% included participants with amphetamine use disorder; 10.9% included participants with methamphetamine use disorder; and 12.5% included participants with any stimulant use disorder. In 18 studies, all participants were in methadone maintenance treatment.

In our primary comparison of any psychosocial treatment to no intervention, we included studies which compared a psychosocial intervention plus TAU to TAU alone. In this comparison, 12 studies evaluated cognitive behavioural therapy (CBT), 27 contingency management, three motivational interviewing, one study looked at psychodynamic therapy, and one study evaluated CBT plus contingency management. We also compared any psychosocial intervention to TAU. In this comparison, seven studies evaluated CBT, two contingency management, two motivational interviewing, and one evaluated a combination of CBT plus motivational interviewing. Seven studies compared contingency management reinforcement related to abstinence versus contingency management not related to abstinence. Finally, seven studies compared two different psychosocial approaches.

We judged 65.6% of the studies to be at low risk of bias for random sequence generation and 19% at low risk for allocation concealment. Blinding of personnel and participants was not possible for the type of intervention, so we judged all the studies to be at high risk of performance bias for subjective outcomes but at low risk for objective outcomes. We judged 22% of the studies to be at low risk of detection bias for subjective outcomes. We judged most of the studies (69%) to be at low risk of attrition bias.

When compared to no intervention, we found that psychosocial treatments: reduce the dropout rate (risk ratio (RR) 0.82, 95% confidence interval (CI) 0.74 to 0.91; 30 studies, 4078 participants; high-certainty evidence); make little to no difference to point abstinence at the end of treatment (RR 1.15, 95% CI 0.94 to 1.41; 12 studies, 1293 participants; high-certainty evidence); make little to no difference to point abstinence at the longest follow-up (RR 1.22, 95% CI 0.91 to 1.62; 9 studies, 1187 participants; high-certainty evidence); probably increase continuous abstinence at the end of treatment (RR 1.89, 95% CI 1.20 to 2.97; 12 studies, 1770 participants; moderate-certainty evidence); may make little to no difference in continuous abstinence at the longest follow-up (RR 1.14, 95% CI 0.89 to 1.46; 4 studies, 295 participants; low-certainty evidence); reduce the frequency of drug intake at the end of treatment (standardised mean difference (SMD) −0.35, 95% CI −0.50 to −0.19; 10 studies, 1215 participants; high-certainty evidence); and increase the longest period of abstinence (SMD 0.54, 95% CI 0.41 to 0.68; 17 studies, 2118 participants; high-certainty evidence).

When compared to TAU, we found that psychosocial treatments reduce the dropout rate (RR 0.79, 95% CI 0.65 to 0.97; 9 studies, 735 participants; high-certainty evidence) and may make little to no difference in point abstinence at the end of treatment (RR 1.67, 95% CI 0.64 to 4.31; 1 study, 128 participants; low-certainty evidence). We are uncertain whether they make any difference in point abstinence at the longest follow-up (RR 1.31, 95% CI 0.86 to 1.99; 2 studies, 124 participants; very low-certainty evidence). Compared to TAU, psychosocial treatments may make little to no difference in continuous abstinence at the end of treatment (RR 1.18, 95% CI 0.92 to 1.53; 1 study, 128 participants; low-certainty evidence); probably make little to no difference in the frequency of drug intake at the end of treatment (SMD −1.17, 95% CI −2.81 to 0.47, 4 studies, 479 participants, moderate-certainty evidence); and may make little to no difference in the longest period of abstinence (SMD −0.16, 95% CI −0.54 to 0.21; 1 study, 110 participants; low-certainty evidence). None of the studies for this comparison assessed continuous abstinence at the longest follow-up.

Only five studies reported harms related to psychosocial interventions; four of them stated that no adverse events occurred.

Authors' conclusions

This review's findings indicate that psychosocial treatments can help people with stimulant use disorder by reducing dropout rates. This conclusion is based on high-certainty evidence from comparisons of psychosocial interventions with both no treatment and TAU. This is an important finding because many people with stimulant use disorders leave treatment prematurely. Stimulant use disorders are chronic, lifelong, relapsing mental disorders, which require substantial therapeutic efforts to achieve abstinence. For those who are not yet able to achieve complete abstinence, retention in treatment may help to reduce the risks associated with stimulant use. In addition, psychosocial interventions reduce stimulant use compared to no treatment, but they may make little to no difference to stimulant use when compared to TAU.

The most studied and promising psychosocial approach is contingency management. Relatively few studies explored the other approaches, so we cannot rule out the possibility that the results were imprecise due to small sample sizes.

PLAIN LANGUAGE SUMMARY

Do psychosocial treatments help people with stimulant use disorder?

Key messages

- Psychosocial treatments reduce the number of participants with stimulant use disorder who leave treatment prematurely and probably increase the length of time they abstain from stimulants, compared to no treatment.
- Compared to usual care, psychosocial treatments help people stay in treatment longer, but probably make little to no difference in the frequency of drug intake.
- More studies are needed comparing different psychosocial approaches to increase our understanding of what treatments are best for whom, when, and in what context.

What is stimulant use disorder?

Stimulant use disorder is a mental disorder characterised by a strong urge to use psychostimulants and the inability to control their use. Cocaine, amphetamines, crack, and MDMA are psychostimulants. Psychostimulants are the second-most commonly used illicit drug worldwide, after cannabis. Stimulant use disorder is associated with serious medical consequences, including delusions and hallucinations, cardiovascular diseases, AIDS, viral hepatitis, and sexually transmitted infections. People with stimulant use disorder are at high risk of being involved in car accidents, crime, sexual abuse, and interpersonal violence.

How is stimulant use disorder treated?

Currently, no medicines are approved for treating stimulant use disorder. Consequently, psychosocial treatments are regarded as suitable alternatives. Psychosocial treatments act on people's memory and learning, and aim to help them develop the skills to deal with stimulant

use disorder. Many types of psychosocial therapy exist, and each has a theory to explain how it helps people change. The most widely-used psychosocial treatments for stimulant use disorder are the following.

• Cognitive behavioural therapy tries to help people recognise and alter their dysfunctional beliefs, negative thoughts, and unwanted behaviours, through behavioural tasks and coping skills.
• Contingency management rewards or 'reinforces' people for positive behavioural change, giving them money, vouchers, or other rewards when they abstain from using stimulants.
• Motivational interviewing aims to resolve people's contradictory feelings about their drug use and increase their readiness to change.
• Psychodynamic therapy uses the therapeutic relationship between a psychotherapist and a client to solve unconscious conflicts and develop insight.
• Twelve-step facilitation are treatments that have adapted the methodology and concepts of Alcoholics Anonymous.

What did we want to find out?

We wanted to find out whether psychosocial treatments help people with stimulant use disorder to reduce or stop using psychostimulants.

What did we do?

We searched for studies where people were allocated at random to one of two or more treatment groups that compared any psychosocial treatment with no treatment or usual care (counselling, education, or information about stimulant use). We summarised the results of the studies and rated our confidence in the evidence, based on factors such as study methods and precision of the results.

What did we find?

We found 64 studies involving a total of 8241 people with stimulant use disorder. Nearly three-quarters of the studies involved people who used cocaine or crack. Most studies were conducted in the USA, and there were 4 studies in Spain, 3 each in Australia and the UK, 2 each in Switzerland, Brazil, and Iran, and 1 each in the Netherlands and South Africa. Overall, the studies offered treatment for an average of 4 months, but the study programmes varied from a single session to a 12-month programme. The studies examined the different types of psychosocial treatments outlined above.

Most studies compared psychosocial treatment with no treatment. Twelve studies compared psychosocial treatment with usual care. Fourteen studies compared one type of psychosocial treatment to another type.

Main results

Compared to no treatment, psychosocial treatments reduce the number of people who leave the study prematurely and probably increase the length of time that they stay off stimulants (i.e. they increase abstinence). They also reduce the frequency of drug intake. They probably help people to have longer periods of abstinence during treatment but may make little to no difference in continuous abstinence in the long term.

Compared to usual care, psychosocial treatments reduce the number of people who leave treatment prematurely. They may have little to no effect on helping people have periods of continuous abstinence during treatment and in increasing the period of abstinence. They probably have little to no effect on the frequency of drug intake.

Five studies assessed whether psychosocial treatments had any negative effects. Of these, 4 studies stated that no negative effects occurred.

What are the limitations of the evidence?

Both the people delivering treatments and the participants knew which type of treatment they were receiving. Therefore, they could have modified their behaviours in a way that would influence the outcomes. However, in most studies, the drug use outcomes reported by participants were verified by urine analysis, so we believe that people's awareness did not influence the results substantially. We cannot be sure that the allocation of participants to groups was done appropriately, as most studies provided insufficient information about this process. Studies comparing psychosocial treatments with usual care were scarce and small, so we are uncertain about our results.

How up to date is this evidence?

The evidence is current to 26 September 2023.

Summary of findings 1. Summary of findings table - Any psychosocial intervention compared to no intervention for adults with stimulant use disorder

Any psychosocial intervention compared to no intervention for adults with stimulant use disorder

Patient or population: adults with stimulant use disorder
Setting: outpatients
Intervention: any psychosocial intervention
Comparison: no intervention

Outcomes	Anticipated absolute effects* (95% CI)		Relative effect (95% CI)	№ of participants (studies)	Certainty of the evidence (GRADE)	Comments
	Risk with no intervention	Risk with any psychosocial intervention				
Dropouts	356 per 1000	**292 per 1000** (263 to 324)	**RR 0.82** (0.74 to 0.91)	4049 (29 RCTs)	⊕⊕⊕⊕ High	
Point abstinence, end of treatment	364 per 1000	**418 per 1000** (342 to 513)	**RR 1.15** (0.94 to 1.41)	1293 (12 RCTs)	⊕⊕⊕⊕ High	
Point abstinence, longest follow-up	436 per 1000	**532 per 1000** (397 to 706)	**RR 1.22** (0.91 to 1.62)	1187 (9 RCTs)	⊕⊕⊕⊕ High	
Continuous abstinence, end of treatment	131 per 1000	**247 per 1000** (157 to 388)	**RR 1.89** (1.20 to 2.97)	1770 (12 RCTs)	⊕⊕⊕⊖ Moderate[a]	
Continuous abstinence, longest follow-up	479 per 1000	**546 per 1000** (407 to 738)	**RR 1.14** (0.85 to 1.54)	266 (3 RCTs)	⊕⊕⊖⊖ Low[b,c]	
Frequency of drug intake, end of treatment	-	SMD **0.35 SD lower** (0.51 lower to 0.18 lower)	-	1186 (9 RCTs)	⊕⊕⊕⊕ High	
Longest period of abstinence	-	SMD **0.54 SD higher** (0.41 higher to 0.68 higher)	-	2118 (17 RCTs)	⊕⊕⊕⊕ High	

*__The risk in the intervention group__ (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; **RR:** risk ratio; **SMD:** standardised 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.

See interactive version of this table: https://gdt.gradepro.org/presentations/#/isof/isof_question_revman_web_440467640937001406.

[a] Downgraded one level for suspicion of publication bias: asymmetrical funnel plot (Figure 6)
[b] Downgraded one level for high risk of selection and attrition bias in studies that contributed most to the overall estimate (weight 64%)
[c] Downgraded one level for imprecision: optimal information size not met

Summary of findings 2. Summary of findings table - Any psychosocial intervention compared to treatment as usual (TAU) for adults with stimulant use disorder

Any psychosocial intervention compared to treatment as usual (TAU) for adults with stimulant use disorder

Patient or population: adults with stimulant use disorder
Setting: outpatients
Intervention: any psychosocial intervention
Comparison: treatment as usual (TAU)

Outcomes	Anticipated absolute effects* (95% CI)		Relative effect (95% CI)	№ of participants (studies)	Certainty of the evidence (GRADE)	Comments
	Risk with treatment as usual (TAU)	Risk with any psychosocial intervention				
Dropouts	407 per 1000	**322 per 1000** (265 to 395)	**RR 0.79** (0.65 to 0.97)	735 (9 RCTs)	⊕⊕⊕⊕ High	
Point abstinence, end of treatment	94 per 1000	**157 per 1000** (60 to 404)	**RR 1.67** (0.64 to 4.31)	128 (1 RCT)	⊕⊕⊖⊖ Low[a]	
Point abstinence, longest follow-up	362 per 1000	**474 per 1000** (311 to 721)	**RR 1.31** (0.86 to 1.99)	124 (2 RCTs)	⊕⊖⊖⊖ Very low[b]	
Continuous abstinence, end of treatment	594 per 1000	**701 per 1000** (546 to 908)	**RR 1.18** (0.92 to 1.53)	128 (1 RCT)	⊕⊕⊖⊖ Low[b]	
Frequency of drug intake, end of treatment	-	SMD **1.17 SD lower** (2.81 lower to 0.47 higher)	-	479 (4 RCTs)	⊕⊕⊕⊖ Moderate[c]	

Longest period of abstinence	-	SMD **0.16 lower** (0.54 lower to 0.21 higher)	-	110 (1 RCT)	⊕⊕⊖⊖ Low[d,e]
Continuous abstinence, longest follow-up - not measured	-	-	-	-	-

*__The risk in the intervention group__ (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; **RR:** risk ratio; **SMD:** standardised 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.

See interactive version of this table: https://gdt.gradepro.org/presentations/#/isof/isof_question_revman_web_440564295462044805.

[a] Downgraded two levels for imprecision: fewer than 100 events
[b] Downgraded one level fo high risk attrition bias
[c] Downgraded one level for inconsistency: I2 98%
[d] Downgraded one level for high risk of attrition bias
[e] Downgraded one level for imprecision: fewer than 400 participants

BACKGROUND

Description of the condition

Cocaine and amphetamine-type stimulants

Cocaine products and amphetamine-type stimulants are the two main recreational classes of psychostimulants (Farrell 2019). Cocaine products comprise coca paste and cocaine base, hydrochloride salt of cocaine, and freebase cocaine (a form of cocaine that can be smoked) (UNODC 2022). Worldwide, the powder of hydrochloride salt is the most commonly-used product, usually by insufflation or 'snorting' (UNODC 2022). In Europe and North America, freebase 'crack' cocaine is also common, whereas in South America and adjacent regions, coca paste and cocaine base are more common products (UNODC 2022). Cocaine hydrochloride and cocaine base can also be injected (UNODC 2022).

Amphetamine-type stimulants comprise amphetamine and methamphetamine (usually named 'amphetamines'), 3,4-methylenedioxymethamphetamine (MDMA or 'ecstasy'), 3,4-methylenedioxyamphetamine (MDA), other psychostimulants such as cathinone, ephedrine, pseudoephedrine, and some medications when used for nonmedical aims, such as dexamphetamine, dextro-amphetamine, methylphenidate, and phentermine (UNODC 2022). Worldwide, methamphetamine, amphetamines, and ecstasy are the most commonly-used amphetamine-type stimulants (UNODC 2022).

According to the World Drug Report from the United Nations Office on Drugs and Crime, in 2020, approximately 21.5 million people used cocaine at least once in the previous year, equivalent to 0.4% of the global population aged 15 to 64, and 34 million people used amphetamines, equivalent to 0.7% of the global population (UNODC 2022). The highest prevalence of cocaine use was observed in Australia and New Zealand (3.6%), followed by North America (2.0%), South America (1.6%), and Western and Central Europe (1.4%) (UNODC 2022). The highest prevalence rate of amphetamine use was observed in North America (3.9%), followed by Australia and New Zealand (1.3%), and Western and Central Europe (0.7%) (UNODC 2022).

Stimulant use disorder

According to the most recent versions of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5 and DSM-5-Text Revision), stimulant use disorder is a severe disorder, characterised by the strong and irrepressible desire to use psychostimulants such as amphetamine-type substances or cocaine, their compulsive use, and inability to control their use despite the knowledge of their negative consequences (DSM 5, American Psychiatric Association 2013; American Psychiatric Association 2022). Diagnosis of stimulant use disorder requires meeting at least two of 11 criteria in a 12-month period, and its severity (mild, moderate, or severe) is based on the number of criteria met (American Psychiatric Association 2013; American Psychiatric Association 2022). In the previous DSM editions, stimulant use disorder was classified into two independent disorders, labelled 'abuse' and 'dependence'. These two disorders, and their diagnostic criteria, have been merged into the single category of 'stimulant use disorder' in DSM 5 (American Psychiatric Association 2013; American Psychiatric Association 2022).

There is considerable diversity amongst people who use stimulants, ranging from those who use these substances occasionally, those who use them regularly, and people with a stimulant use disorder (Farrell 2019). Farrell and colleagues also point out that cocaine and amphetamine are used for *treating* certain conditions: cocaine as a local anaesthetic agent and amphetamines in the treatment of attention-deficit hyperactivity disorder, obesity, and narcolepsy (Farrell 2019). Some studies have reported that people who smoke or inject stimulants have a higher risk of developing stimulant use disorder than those who use stimulants intranasally (McKetin 2006; Volkow 2004).

Stimulant use disorder has a chronic, relapsing, and progressive course (American Psychiatric Association 2013; American Psychiatric Association 2022; Dackis 2001). It represents a significant public health problem and a treatment priority because of the highly addictive properties of stimulant agents (American Psychiatric Association 2013). This disorder may cause serious somatic and psychiatric damage (American Psychiatric Association 2013; American Psychiatric Association 2022; Gawin 1988). These include an increased risk of death by suicide, overdose, acute (e.g. myocardial infarction) and chronic cardiovascular diseases (e.g. cardiomyopathy), car accidents, and homicides (Farrell 2019). Some of the frequent medical consequences for people with stimulant use disorder include a wide spectrum of psychiatric symptoms, ranging from depressive symptoms (during withdrawal from use of stimulants) to psychotic disorders and delusions during intoxication with stimulants (American Psychiatric Association 2013; American Psychiatric Association 2022). People with stimulant use disorder are at high risk for blood-borne viral infections such as HIV infection (or AIDS), hepatitis C (HCV) and hepatitis B (HBV), and sexually transmitted infections (Conner 2008; Cornish 1996; Cregler 1989; Darke 2004; Degenhardt 2005; Degenhardt 2012; Degenhardt 2017; Falck 2003; Farrell 2019; Haasen 2005; Kaye 2004; Marzuk 1992; Mathers 2008; Mooney 2006; Ribeiro 2006; Roy 2001). Several studies show a close link between the use of stimulants (including crack, cocaine, and amphetamines) and violent behaviours such as crime, sexual abuse, and interpersonal violence (Atkinson 2014; Farrell 2019).

Stimulant use disorder is the most common illicit drug use disorder after opioid use disorder (Degenhardt 2013; Degenhardt 2014; GBD 2018). According to a study that encompassed 195 countries, in 2016, there were 5.8 million estimated cases of cocaine use disorder (age-standardised prevalence of 77.6 cases per 100,000 people, 95% uncertainty interval (UI) 70.7 to 85.9) and 5 million estimated cases of amphetamine use disorder (age-standardised prevalence of 64.7 cases per 100,000 people (95% UI 48.3 to 84.8)) (GBD 2018). The prevalence was higher amongst men than women, for both cocaine use disorder (women: 49.4 cases per 100,000 people (95% UI 44.7 to 54.9); men: 105.5 cases per 100,000 people (95% UI 96.3 to 116.3)) and amphetamine use disorder (women: 45.4 cases per 100,000 people (95% UI 33.9 to 59.5); men: 83.2 cases per 100,000 people (95% UI 62.4 to 109.3)) (GBD 2018). Prevalence rates of cocaine use disorder and amphetamine use disorder increased from 1990 to 2016 by 39.7% and 22.5%, respectively (GBD 2018). The estimated prevalence varied widely by region. The highest prevalence of cocaine use disorder was estimated to be in North America (524.1 cases per 100,000 people (95% UI 484.6 to 567.0)), followed by Southern Latin America (259.6 cases per 100,000 people (95% UI 227.7 to 295.8)), Australasia (234.9 cases per 100,000 people (95% UI 204.1 to 267.6)), and Western Europe (162.8

cases per 100,000 people (95% UI 146.1 to 181.2)) (GBD 2018). The highest prevalence of amphetamine use disorder was estimated to be in Australasia (574.2 cases per 100,000 people (95% UI 483.7 to 664.7)), followed by North America (240.5 cases per 100,000 people (95% UI 202.5 to 287.2)), Southern Latin America (179.3 cases per 100,000 people (95% UI 126.3 to 252.0)), Southeast Asia (126.4 cases per 100,000 people (95% UI 84.3 to 177.9)), and Western Europe (110.2 cases per 100,000 people (95% UI 84.3 to 146.6)) (GBD 2018), with the highest burden attributable to cocaine use disorder and amphetamine use disorder observed in North America (GBD 2018).

In 2020, although all indicators suggested an increase in the use of both cocaine products and amphetamine-type stimulants, most countries reported a decrease in the numbers of people in drug treatment (UNODC 2022). This reduction mirrors the overall decrease in drug treatment observed during the COVID-19 pandemic (UNODC 2022). In addition, although women account for approximately one in three people with stimulant use disorder (GBD 2018), only one in five people in treatment for these disorders is a woman (UNODC 2022).

Description of the intervention

At the present time, there is no widely accepted treatment for stimulant use disorder. Regarding pharmacological treatment, no medication has been specifically approved for this disorder (Chan 2019a; Chan 2019b; Knapp 2007; Farrell 2019; Paulus 2020). Several medications have been investigated, including bupropion (Chan 2020; Siefried 2020), mirtazapine (Naji 2022), antipsychotics (Kishi 2013), anticonvulsants (Minozzi 2015), disulfiram (Pani 2010), and psychostimulants (Castells 2010; Tardelli 2023). However, there is insufficient evidence to support their use in the treatment of stimulant use disorder (Ronsley 2020). Accordingly, psychosocial treatments are usually suggested as a suitable alternative approach (Ronsley 2020).

We included in this systematic review only textbook-recognised, standardised psychosocial interventions (De Leon 1995; NICE 2007). The interventions that we considered for inclusion were: cognitive behavioural therapy, contingency management, motivational interviewing, interpersonal therapy, psychodynamic therapies, and 12-step facilitation. We did not consider clinical management, case management, or drug counselling.

Cognitive behavioural therapy

Cognitive behavioural therapy (CBT) is a structured psychotherapy focused on resolving current problems and adjusting dysfunctional cognitive and behavioural patterns (Beck 2011; Magill 2023). We describe the various forms of CBT considered in this review below.

Cognitive therapy

Cognitive therapy is based on the assertion that stimulant use disorder is related to an individual's dysfunctional beliefs and associated cognitive processes. Cognitive therapy for stimulant use disorder consists of different elements alongside the use of cognitive and behavioural techniques, such as collaboration, case conceptualisation, structure, and socialisation to the cognitive model. Amongst the cognitive techniques used are advantages-disadvantages analysis, activity monitoring and scheduling, Socratic questioning, monitoring of drug-related beliefs, and role-playing (Beck 2011).

Coping skills training/relapse prevention

Coping skills training and relapse prevention interventions are focused on reducing the possibility of relapse by strengthening the individual's ability to cope with high-risk situations. These interventions are specifically designed to identify and reduce subjective craving for psychoactive substances. The aim is to help people deal with high-risk situations for psychostimulant use and develop strategies to cope with and control the urge. In this approach, people are encouraged to reduce psychostimulant use, to explore the consequences of stimulant use disorder, to recognise high-risk situations for relapse, to develop strategies to deal with craving, to be prepared for emergencies, and to identify alternative activities to psychostimulant use (Carroll 2005).

Community reinforcement approach

Community reinforcement approach is a multicomponent approach that considers that environmental events influence habitual psychostimulant use. It is focused on providing skills training, improving relations, offering employment and vocational counselling, and cultivating new activities and social networks (Bickel 1997; Roozen 2004). In various randomised controlled trials (RCTs), the community reinforcement approach has been associated with contingency management.

Contingency management

Contingency management provides a system of incentives designed to make abstinence more attractive than continual psychostimulant use (Hall 1977). Since its inception, contingency management has been widely studied for stimulant use disorder (NICE 2007), and it now comprises different methods to provide reinforcement, which usually happens when individuals provide a negative urine analysis for the tested drug. The reinforcement can be money, vouchers, prizes, or even clinic privileges (Rawson 2002 arm 1; Shoptaw 2006).

Motivational interviewing

Motivational interviewing is a psychosocial intervention that aims to evoke and strengthen personal motivation for change. It was first developed for people with alcohol use disorder, and subsequently applied to use disorders for other substances (Hettema 2005; Miller 1992; Miller 2003).

Interpersonal therapy

Interpersonal therapy is a supportive, time-limited psychotherapy, originally developed for the treatment of depression. It is based on the assumption that psychiatric disorders are due to defective interpersonal relationships, which may be related to the genesis and protraction of the disorders (Van Schaik 2006).

Psychodynamic therapy

Psychodynamic therapies view substance use disorders in a broad context considering the individual's interpersonal and intrapsychic functioning. The unconscious, core conflictual relationship themes and defences make it difficult to stop stimulant use. Psychodynamic psychotherapists apply supportive, expressive, and interpretative techniques to help patients explore those aspects of self that are not fully known, especially those which most interfere with the accomplishment of a patient's goals (Shedler 2010).

Twelve-step facilitation

Twelve-step facilitation consists of a structured and brief intervention to facilitate early recovery from alcohol and other substance use disorders (Chappel 1999). It is based on cognitive, behavioural, and spiritual principles. The path is designed in 12 steps, which are the core of the intervention, based on groups such as Alcoholics Anonymous (AA) and Narcotics Anonymous (NA) (Ferri 2006).

How the intervention might work

Studies using functional magnetic resonance imaging suggest that psychosocial treatments can influence the brain's reward system by inhibiting activation in brain regions that respond to satiety (Feldstein 2011). People with cocaine use disorder present with poor cognitive control, cue reactivity (which results in them having physiological and psychological reactions when they are exposed to drug cues or stimuli), and craving that leads them through appetitive motivational states (Worhunsky 2013). Psychosocial interventions act on all of these domains by acting on memory and learning. Memory and learning bring neuroadaptive changes and neural plasticity (Koob 2010). Neural plasticity entails changes in the brain structure and circuitry, which may occur as a result of experience or learning. Indeed, neural plasticity is present at multiple levels and facilitates cognitive control (Bryck 2012). This circle, starting from an at-risk condition of poor cognitive control, and arriving at neuroadaptive changes and neural plasticity (Koob 2010), shows us how psychotherapies can change the brain structure and reminds us that mind and brain are intimately correlated. Under this assumption, psychosocial interventions may alleviate stimulant use disorder, reducing craving and the risk of relapse. Although the various psychosocial interventions start from very different theoretical assumptions and the therapeutic techniques differ according to the model adopted, all these interventions aim to counteract the addictive behaviours underlying stimulant use disorder.

As the previous section has already touched on, each psychosocial intervention considered in this review adopts a specific theory to explain its psychological and behavioural mechanisms of effect. Briefly, the mechanisms of action of the main treatments considered here are the following. CBT is aimed at reducing dysfunctional beliefs, negative thoughts, and unwanted behaviours, through behavioural tasks and coping skills training (Klimas 2018). Contingency management uses reinforcing and punishing consequences to alter substance use (Witkiewitz 2011). Motivational interviewing is aimed at increasing an individual's motivation and readiness to change (Foxcroft 2016). Psychodynamic therapy employs the therapeutic relationship between psychotherapist and client to solve unconscious conflicts and develop insight (Klimas 2018). Twelve-step facilitations are clinical interventions that have adapted the methodology and concepts of Alcoholics Anonymous (Kelly 2020).

Why it is important to do this review

The Cochrane Drugs and Alcohol Group has performed various reviews of psychosocial treatments for different substance use disorders (e.g. Amato 2011a; Amato 2011b; Gates 2016; Hunt 2019; Klimas 2014; Klimas 2018; McGovern 2021; Minozzi 2014; Smedslund 2011). In recent years, research on psychosocial treatments for stimulant use disorder has rapidly developed, in part due to the relative inefficacy of pharmacological treatments (Dellazizzo 2023; Farrell 2019; Paulus 2020; Rawson 2023; Ronsley 2020; Tran 2021). High dropout rates suggest that specific approaches to compliance are important, and that some types of psychosocial interventions may be promising treatments, helping people with stimulant use disorder to have realistic beliefs and to set short-term objectives. This may keep people in treatment and abstinent, and may also help to prevent relapses (Carroll 2005). However, evidence of the efficacy of psychosocial treatments for stimulant use disorder is still unclear. This is an update of a Cochrane review first published in 2016.

OBJECTIVES

To assess the efficacy and safety of psychosocial interventions for stimulant use disorder in adults.

METHODS

Criteria for considering studies for this review

Types of studies

We included parallel, individually-randomised controlled trials (RCTs) and cluster-randomised controlled trials (cluster-RCTs).

Types of participants

Adults (18 years and older) with a diagnosis of stimulant dependence, abuse, or stimulant use disorder according to the *Diagnostic and Statistical Manual of Mental Disorders* (DSM) III, IV, or 5, or the ninth, tenth, or eleventh revision of the *International Classification of Diseases* (ICD-9, ICD-10, or ICD-11; see https://icd.who.int/en) criteria, irrespective of pattern of use, sex, age, or nationality. We considered psychostimulants to be any substance that activates, enhances, or increases neural activity (WHO 2006). We included trials in people with additional diagnoses of substance use disorders for other substances, such as alcohol or cannabis, and people with comorbid psychiatric disorders. We also included trials in people with opiate use disorder, those in methadone maintenance schemes, or both. We excluded studies aiming to prevent relapse in participants who were already detoxified.

Types of interventions

Experimental interventions

We considered any of the following psychosocial treatments:

- cognitive behavioural therapies (CBT), including: cognitive therapy, community reinforcement approach, coping skills training (CST), relapse prevention;
- contingency management approach;
- motivational interviewing approach (motivational interviewing, motivational enhancement);
- interpersonal therapy approach;
- psychodynamic therapy and supportive expressive therapy;
- 12-step facilitation approach.

We included studies if they considered the above treatments alone or in combination with other types of treatment.

We did not include other, eclectic approaches. We only included structured and standardised interventions.

Case management and counselling are usually provided in standard care (treatment as usual), so we did not consider them amongst the experimental interventions.

We excluded studies that compared the same type of intervention given in a different modality or at a different intensity (e.g. intensive versus standard, group versus individual, long versus short).

Control interventions

- No treatment
- Treatment as usual (TAU; including individual or group counselling, case management, clinical management, or educational/informative interventions)
- Other psychosocial treatment
- Pharmacological treatment

Types of comparisons foreseen

- Any psychosocial approach versus no treatment (including studies where any psychosocial intervention was given in addition to any other treatment, including TAU, which was received by both groups), stratified for type of intervention
- Any psychosocial approach versus TAU, stratified for type of intervention
- Single psychosocial approach versus an alternative psychosocial approach

Types of outcome measures

Primary outcomes

- Dropouts from treatment: number of participants who did not complete the study protocol
- Use of the primary stimulant substance, measured as:
  - Point abstinence at the end of treatment (number of participants who self-reported abstinence, gave negative urine samples, or both)
  - Point abstinence at the longest follow-up (number of participants who self-reported abstinence, gave negative urine samples, or both)
  - Continuous abstinence at the end of treatment (number of participants who self-reported continuous abstinence, gave negative urine samples, or both, for at least half of the duration of treatment)
  - Continuous abstinence at the longest follow-up (number of participants who self-reported continuous abstinence, gave negative urine samples, or both, for at least half of the duration of the longest follow-up)
  - Frequency of drug intake at the end of treatment
  - Longest period of abstinence at the end of treatment

Secondary outcomes

- Craving, as measured by validated scales (e.g. Brief Substance Craving Scale (BSCS), visual analogue scale (VAS))
- Severity of dependence, as measured by validated scales (e.g. Addiction Severity Index (ASI), Clinical Global Impression scale-Severity of illness (CGI-S)
- Depression, as measured by validated scales (e.g. Hamilton Depression Rating Scale, Beck Depression Inventory)
- Adverse events, measured by number of participants with at least one adverse event

We assessed the secondary outcomes at the end of treatment.

Search methods for identification of studies

Electronic searches

We searched the following electronic databases.

- Cochrane Drugs and Alcohol Group (CDAG) Specialised Register (inception to 26 April 2022), using the search strategy outlined in Appendix 1.
- Cochrane Central Register of Controlled Trials (CENTRAL) (2023, Issue 9), using the search strategy outlined in Appendix 2.
- MEDLINE (via OVID) (January 1966 to 26 September 2023), using the search strategy outlined in Appendix 3.
- Embase (via OVID) (January 1974 to 26 September 2023), using the search strategy outlined in Appendix 4.
- CINAHL (Cumulative Index to Nursing and Allied Health Literature; EBSCO HOST) (1982 to 26 September 2023), using the search strategy outlined in Appendix 5.
- Web of Science (Thomson Reuters) (January 2006 to 26 September 2023), using the search strategy outlined in Appendix 6.
- PsycINFO (via OVID) (1800 to 26 September 2023), using the search strategy outlined in Appendix 7.

We searched the databases using medical subject headings (MeSH) and text words relating to psychological interventions and stimulant use disorder. We combined the MEDLINE search with the Cochrane Highly Sensitive Search Strategy for identifying RCTs in MEDLINE: sensitivity-maximising version (2008 revision; Lefebvre 2011). We revised this strategy appropriately for each database to take account of differences in controlled vocabulary and syntax rules.

We searched for ongoing clinical trials and unpublished trials via Internet searches on the following websites.

- ClinicalTrials.gov (www.clinicaltrials.gov) (26 September 2023);
- World Health Organization (WHO) International Clinical Trials Registry Platform (ICTRP) (apps.who.int/trialsearch/) (26 September 2023), using the search strategy outlined in Appendix 8.

Searching other resources

We also used the following sources:

- references of the articles obtained by any means;
- conference proceedings likely to contain trials relevant to the review. These included proceedings from the Society for the Study of Addiction, International Harm Reduction Association, and the American Association for the Treatment of Opioid Dependence.
- contact with investigators and relevant trial authors, seeking information about unpublished or incomplete trials.

All searches included non-English language literature, and we assessed studies with non-English abstracts for inclusion. When we considered that the studies likely met the inclusion criteria, we had them translated.

Data collection and analysis

Selection of studies

Two authors (FT, RA) independently screened the abstracts of all publications obtained by the search strategy. Two authors (FT, RA) independently assessed the full texts of potentially relevant studies for inclusion. We resolved any disagreements by discussion or consulting a third review author (SM).

Data extraction and management

Two authors (RS, FT) extracted data. SM and RA checked all the data extraction forms. We resolved any doubts by discussion amongst the review author team. We extracted the following information: number and characteristics of participants, setting, type of experimental and control intervention, length of follow-up, types of outcomes, country of origin, funding, and conflicts of interest.

Assessment of risk of bias in included studies

Two authors (SM, FT) independently assessed the risk of bias of the included studies. We used the criteria recommended by the *Cochrane Handbook for Systematic Reviews of Interventions* (Higgins 2011). The recommended approach for assessing risk of bias in studies included in Cochrane reviews is a two-part tool, addressing the following specific domains: sequence generation and allocation concealment (selection bias), blinding of participants and personnel (performance bias), blinding of outcome assessors (detection bias), incomplete outcome data (attrition bias), and selective outcome reporting (reporting bias). The first part of the tool involves describing what was reported to have happened in the study, and the second elicits a judgement of low, high, or unclear risk of bias for that entry. To make these judgements, we used the criteria indicated by the *Cochrane Handbook for Systematic Reviews of Interventions*, adapted to the addiction field. See Appendix 9 for details.

We assessed the domains sequence generation and allocation concealment (avoidance of selection bias) at a study level. We considered blinding of participants, personnel, and outcome assessors (avoidance of performance bias and detection bias) separately for objective outcomes (e.g. dropout, use of primary stimulant substance measured by urine analysis, participants relapsed at the end of follow-up) and subjective outcomes (e.g. participant-reported use of substance, craving, severity of signs and symptoms of withdrawal, depression, adverse events).

Measures of treatment effect

We analysed dichotomous outcomes by calculating the risk ratio (RR) for each trial with the uncertainty in each result being expressed with a 95% confidence interval (CI). We planned to analyse continuous outcomes by calculating the mean difference (MD) with 95% CI when the studies used the same instrument for assessing the outcome, and the standardised mean difference (SMD) when the studies used different instruments. In the event, the included studies used different instruments for, or ways of measuring, the continuous outcomes. Therefore, we used SMDs for all the continuous outcomes. We also used the SMD for the very few comparisons where only one study was included, to increase the comparability of outcomes across comparisons. We did not use data presented as the number of positive urine tests over the total number of tests in the experimental and control groups as a measure of substance use. We made this decision because using the number of tests, instead of the *number of participants who had one (or more) positive test result*, as the unit of the analysis violates the hypothesis of independence amongst observations. In fact, the results of tests done for each participant are not independent.

Unit of analysis issues

For multi-arm studies that compared different treatments with the same control group, we divided the number of events and the number of participants of the control group by the number of experimental arms to avoid double-counting participants in the control groups. This approach only partially overcomes the unit-of-analysis error (because the resulting comparisons remain correlated) (Higgins 2023). However, we determined that it was the best method for those studies that compared different types of psychosocial treatments to a single control group, where we were interested both in the overall estimate and in the stratified analysis for each type of psychosocial intervention.

For multi-arm studies that compared different intensities or frequencies of the same experimental intervention with the same control group, we combined the experimental arms into one arm to create a single pair-wise comparison (Higgins 2023).

We analysed cluster-randomised trials according to methods described in the *Cochrane Handbook for Systematic Reviews of Interventions* (Higgins 2023). If studies did not control for clustering, we imputed the intracluster correlation coefficient (ICC) from similar studies. We divided the effective sample size of each arm by the "design effect" quantity (1 + (M-1) x ICC), where M is the average cluster size.

Dealing with missing data

We included all randomised participants in the statistical analysis, without any imputation of missing data. If standard deviations (SDs) were missing, we used the mean of the available SDs of the other included studies (Furukawa 2006)

Assessment of heterogeneity

We analysed heterogeneity using the I^2 statistic and the Chi^2 test. We regarded heterogeneity as substantial if the I^2 statistic was greater than 50% or if P was less than 0.10 for the Chi^2 test for heterogeneity. Following the guidance in the *Cochrane Handbook for Systematic Reviews of Interventions* (Deeks 2022), we distinguished the following values: 0% to 40% denoted no important heterogeneity; 30% to 60% moderate heterogeneity; 50% to 90% substantial heterogeneity; and 75% to 100% considerable heterogeneity. If we found considerable heterogeneity (i.e. 75% or above), we explored possible reasons by visually inspecting the forest plot to identify studies that might be contributing to heterogeneity.

Assessment of reporting biases

We visually inspected funnel plots (plots of the effect estimate from each study against the sample size or effect standard error) to indicate possible publication bias. We acknowledge that funnel plots should be seen as a generic means of displaying small-study effects – a tendency for the intervention effects estimated in smaller studies to differ from those estimated in larger studies, so that asymmetry could be due to publication bias – but small-study effects may be due to reasons other than publication bias,

such as greater risk of bias in smaller studies, inclusion of a more restricted and thus responsive population, or merely due to the role of chance. We inspected funnel plot symmetry when there were at least 10 studies included in the meta-analysis.

Data synthesis

We combined the outcomes from the individual trials through meta-analysis where possible (comparability of intervention and outcomes between trials) using a random-effects model because we expected a certain degree of heterogeneity amongst trials.

Subgroup analysis and investigation of heterogeneity

We performed subgroup analyses for the primary outcomes reported by at least 10 studies. We created three subgroups: trials in which all participants had comorbid opiate dependence and were in methadone treatment; trials with variable percentages of participants with comorbid opiate dependence and in methadone treatment; trials with no participants with opiate dependence and in methadone treatment.

Sensitivity analysis

To incorporate our assessment of risk of bias in the review process, we first plotted the intervention effect estimates, stratified by risk of bias for allocation concealment (selection bias), blinding of outcome assessors (detection bias), and attrition bias. If there were differences in the results between studies with different risks of bias, we performed sensitivity analyses by excluding studies with a high risk of bias from the analysis.

Summary of findings and assessment of the certainty of the evidence

The Grading of Recommendation, Assessment, Development and Evaluation (GRADE) Working Group developed a system for grading the certainty of evidence that considers issues related to internal validity (i.e. risk of bias), consistency of the results, precision of estimate, external validity, such as directness of results, and suspicion of publication bias (GRADE 2004; Guyatt 2008; Guyatt 2011; Schünemann 2006). Using the GRADE system, two review authors (SM, RA) assessed the overall certainty of the evidence for the primary outcomes of the two main comparisons: (1) any psychosocial intervention versus no intervention (including studies which compared any psychosocial treatment plus TAU to TAU alone), and (2) any psychosocial intervention versus TAU. We have presented summary of findings tables for these two main comparisons. This is a transparent and simple tabular format 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 to assign a grade of evidence certainty.

- High: we are very confident that the true effect lies close to that of the estimate of the effect.
- Moderate: 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: our confidence in the effect estimate is limited. The true effect may be substantially different from the estimate of the effect.
- Very low: we have very little confidence in the effect estimate. The true effect is likely to be substantially different from the estimate of effect.

The certainty of the evidence is downgraded by one (−1) or two (−2) levels 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.
- Strong suspicion of publication bias (−1).

We used GRADEpro GDT software to prepare the summary of findings tables (GRADEpro GDT).

RESULTS

Description of studies

Results of the search

For this update, after removing duplicates, we were left with 1799 unique references for screening. Of these, we excluded 1751 on the basis of title and abstract. We retrieved 48 articles in full text for more detailed evaluation, 19 of which we excluded for not meeting the inclusion criteria, six were ongoing studies, and three had been included in the previous version of the review. Finally, we included 12 new studies (20 records) that satisfied all criteria required for inclusion in the review. See Figure 1.

Figure 1. Study flow diagram

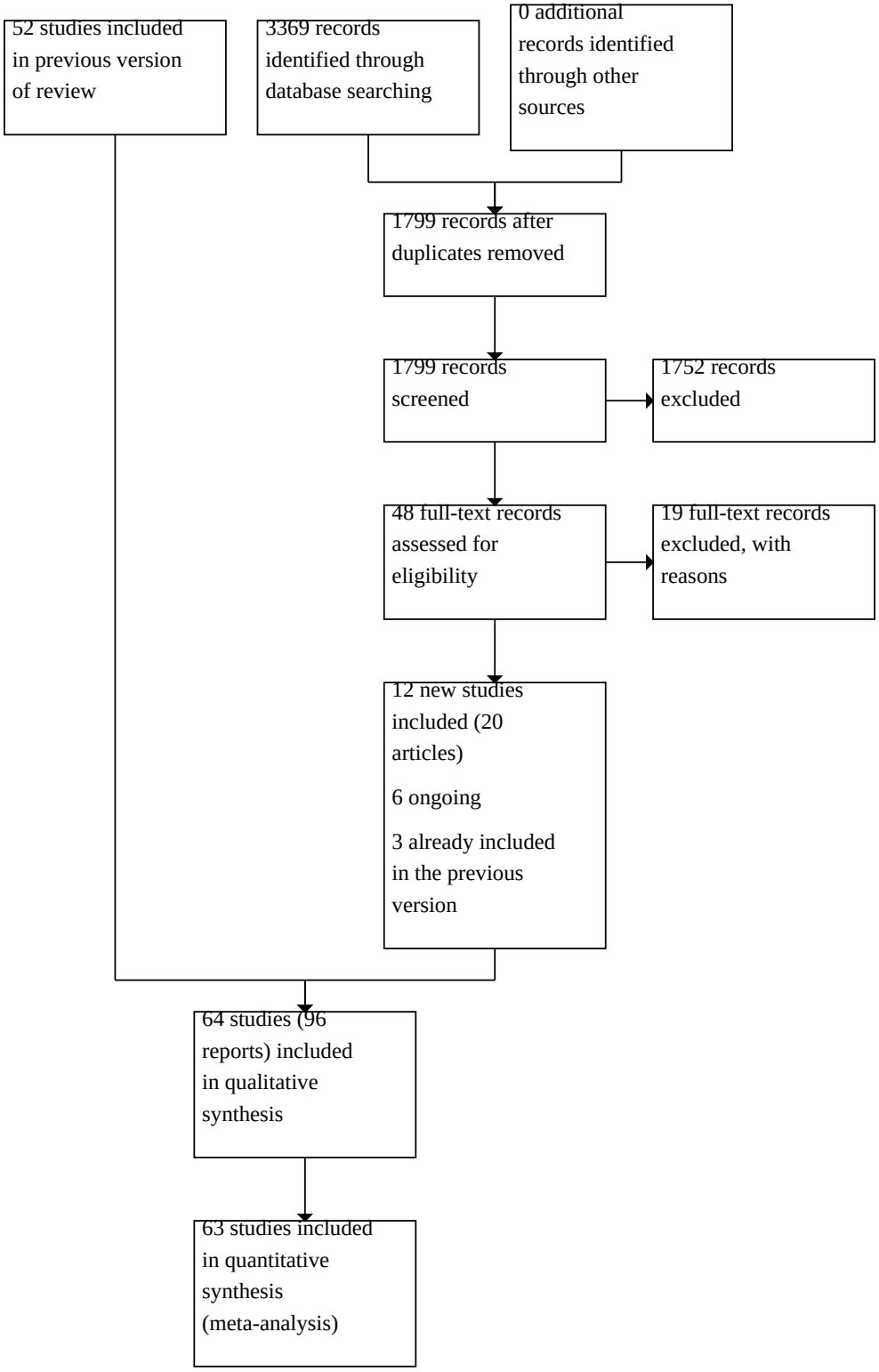


Figure 1. (Continued)

For substantive descriptions of studies, see Characteristics of included studies, Characteristics of excluded studies, and Characteristics of ongoing studies.

Included studies

Overall, we included 64 randomised controlled trials (RCTs) (52 included in the previous version and 12 in this update), involving a total of 8241 participants (see Characteristics of included studies). We did not include data from one study in meta-analysis as it did not report the number of clusters and their sizes (Mitcheson 2007), and therefore, it was not possible to adjust the data for the "design effect". Thus, we included 63 studies in the quantitative synthesis. We reclassified one RCT included in the previous version (NCT01140880) as a secondary reference of an already included RCT (Landovitz 2015). We included three studies with multiple experimental arms that were eligible for inclusion in the review. As noted in Unit of analysis issues, our approach to these studies was to divide the number of events and the number of participants of the control group by the number of experimental arms to create two or more pair-wise comparisons per study. One RCT had two arms (labelled as Crits-Christoph 1999 arm 1 and Crits-Christoph 1999 arm 2 in the Characteristics of included studies table and the analyses), one had four arms (Rawson 2002 arm 1, Rawson 2002 arm 2, Rawson 2002 arm 3, Rawson 2002 arm 4), and one had three arms (Shoptaw 2005 arm 1, Shoptaw 2005 arm 2, Shoptaw 2005 arm 3).

Studies ranged in size from 19 (Petry 2013) to 487 participants (Crits-Christoph 1999 arm 1). Twenty-seven studies recruited fewer than 100 participants. The mean age of participants was about 38 years, and there were more men (about 71%) than women. Forty-six studies took place in the USA, four in Spain, three in Australia, three in the UK, two in Switzerland, two in Brazil, two in Iran, and one each in the Netherlands and South Africa.

Forty-seven studies (73.4%) included participants with cocaine or crack cocaine use disorder; two (3.1%) included participants with amphetamine use disorder; seven (10.9%) included participants with methamphetamine use disorder; and eight (12.5%) included participants with any stimulant use disorder by any psychostimulant.

In 18 studies, all participants were in methadone maintenance treatment (Alammehrjerdi 2019; Blanken 2016; Carroll 2012; Carroll 2014; Carroll 2018; Dursteler-MacFarland 2013; Ghitza 2007; Knealing 2006; Mitcheson 2007; Peirce 2006; Petry 2005b; Petry 2007; Petry 2012a; Petry 2015; Poling 2006; Rawson 2002 arm 1; Rawson 2002 arm 2; Rawson 2002 arm 3; Rawson 2002 arm 4; Silverman 1996; Silverman 1998). In four studies, the proportion of participants with comorbid opioid dependence and methadone maintenance ranged from 36.4% to 67% (Baker 2001; Marsden 2018; Petitjean 2014; Petry 2013).

In 19 studies, participants reported also having alcohol use disorder, with percentages ranging from 17% (Peirce 2006) to 100% (Carroll 1998). In eight studies, participants reported cannabis use disorder, and in three studies, participants had substance use disorder for multiple psychoactive substances.

In 23 studies, participants had other psychiatric disorders, such as mood disorders, anxiety, psychotic disorders, or antisocial personality disorders.

The mean duration of the interventions was 3.7 months (or roughly 16 weeks), with the number of sessions offered to participants ranging from one session (Marsden 2006; Mitcheson 2007) to multiple sessions over 12 months (Parsons 2018).

The included studies assessed the severity of craving using the following scales: Cocaine Craving Questionnaire (Tiffany 1993; 3 studies: Festinger 2014; Pirnia 2016; Silverman 1998); Penn craving scale (Flannery 1999; one study: Sorsdahl 2021), and Craving Experiences Questionnaire (CEQ-F) (May 2014; one study: Marsden 2006). The severity of stimulant use disorder was measured using the following scales: Severity of Dependence Scale (SDS) (Gossop 1995; two studies: Alammehrjerdi 2019; Mitcheson 2007); Leeds Dependence Questionnaire (LDQ) (Raistrick 1994; one study: Smout 2010); Clinical Global Impressions Scale (CGI) (Busner 2007; one study, Sorsdahl 2021); and Addiction Severity Index (ASI) (Mclellan 1992; seven studies: Garcia-Fernandez 2011; Higgins 1994; Higgins 2000; Ingersoll 2011; Petry 2005b; Roll 2013; Sanchez-Hervas 2010). Lastly, studies measured the presence of depressive symptoms using the Beck Depression Inventory II (BDI-II) (Beck 1996; two studies: Garcia-Fernandez 2011; Smout 2010), the Montgomery-Åsberg Depression Rating Scale (MADRS) (Montgomery 1979; one study: Mimiaga 2019), and the Hamilton Depression Rating Scale (HAM-D) (Maier 1988; one study: Sorsdahl 2021).

Types of interventions and comparisons

The included studies considered the following psychosocial interventions: cognitive behavioural therapy (CBT), contingency management, motivational interviewing, a combination of CBT and contingency management, a combination of CBT and motivational interviewing, interpersonal therapy, psychodynamic therapy, and 12-step facilitation.

Comparison 1: any psychosocial intervention versus no intervention

In this comparison, we also included any studies which gave a psychosocial intervention plus TAU compared to TAU alone.

CBT versus no intervention: 12 studies (Baker 2001, Baker 2005; Carroll 2014; Carroll 2018; Crits-Christoph 1999 arm 1; Higgins 2003; Marsden 2018; McKee 2007; Milby 2008; Mimiaga 2019; Rawson 2002 arm 1; Shoptaw 2005 arm 2)

Contingency management versus no intervention: 27 studies (Blanken 2016; Carroll 2016;Festinger 2014; Garcia-Fernandez 2011; Ghitza 2007; Hagedorn 2013; Higgins 1994; Kirby 1998; Ledgerwood 2006; Menza 2010; Miguel 2017; Miguel 2022; Peirce 2006; Petitjean 2014; Petry 2005a; Petry 2005b; Petry 2007; Petry 2013; Petry 2012a; Petry 2012b; Petry 2015; Petry 2018; Pirnia 2016; Rawson 2002 arm 2; Roll 2013; Secades Villa 2013; Shoptaw 2005 arm 3)

Motivational interviewing versus no intervention: three studies (Marsden 2006; McKee 2007; Stein 2009). We did not include Mitcheson 2007, a cluster-RCT with a total sample size of 29 participants, in the meta-analyses as it did not report the number of clusters and their sizes and, therefore, it was not possible to adjust the data for the "design effect".

Psychodynamic therapy versus no intervention: one study (Crits-Christoph 1999 arm 2)

Combination of CBT plus contingency management versus no intervention: one study (Rawson 2002 arm 3)

Comparison 2: any psychosocial intervention versus TAU

CBT versus TAU: seven studies (Alammehrjerdi 2019; Carroll 1994; Dursteler-MacFarland 2013; Higgins 1993; Rawson 2002 arm 1; Sanchez-Hervas 2010; Shoptaw 2008)

Contingency management versus TAU: two studies (Garcia-Rodriguez 2007; Knealing 2006)

Motivational interviewing versus TAU: two studies (Ingersoll 2011; Sorsdahl 2021)

Combination of CBT plus motivational interviewing versus TAU: one study (Parsons 2018)

Comparison 3: contingency management versus non-contingent management (reinforcement related to abstinence versus reinforcement not related to abstinence)

Seven studies (Higgins 2000; Landovitz 2015; McDonell 2013; Poling 2006; Schottenfeld 2011; Silverman 1996; Silverman 1998)

Comparison 4: any psychosocial intervention versus an alternative psychosocial intervention

CBT versus 12-step facilitation: two studies (Carroll 1998; Maude-Griffin 1998)

CBT versus interpersonal therapy: two studies (Carroll 1991; Carroll 2004)

CBT versus contingency management: two studies (Rawson 2002 arm 4; Shoptaw 2005 arm 1)

CBT versus acceptance and commitment therapy (ACT): one study (Smout 2010)

Excluded studies

We excluded 85 studies for the following reasons: ineligible participants (48 studies); ineligible interventions (24 studies); ineligible comparisons: this category included eight studies which compared the same intervention delivered at different intensities, frequencies, or modalities, and two studies for an otherwise ineligible comparison (10 studies in total); ineligible study design (three studies).

Risk of bias in included studies

See Figure 2 and Figure 3. For detailed descriptions of the reasons supporting our judgements, see the risk of bias tables in the Characteristics of included studies.

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

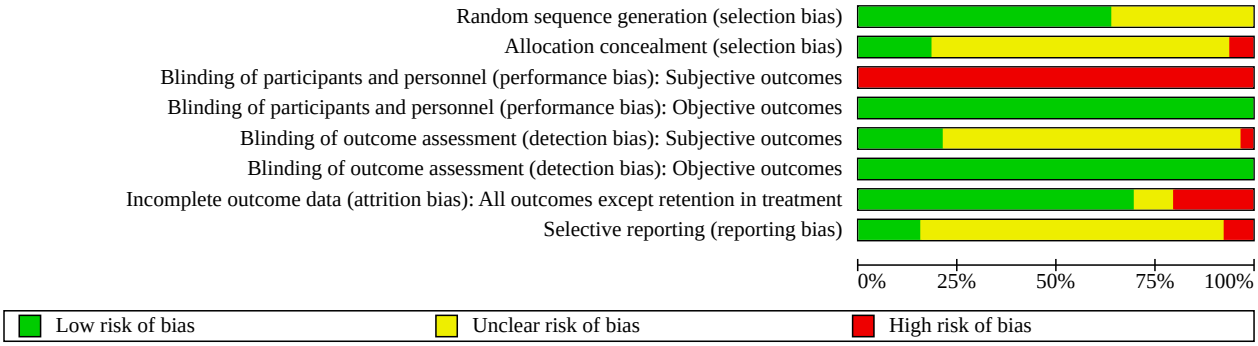


Figure 3. Risk of bias summary: review authors' judgements about each risk of bias item for each included study.

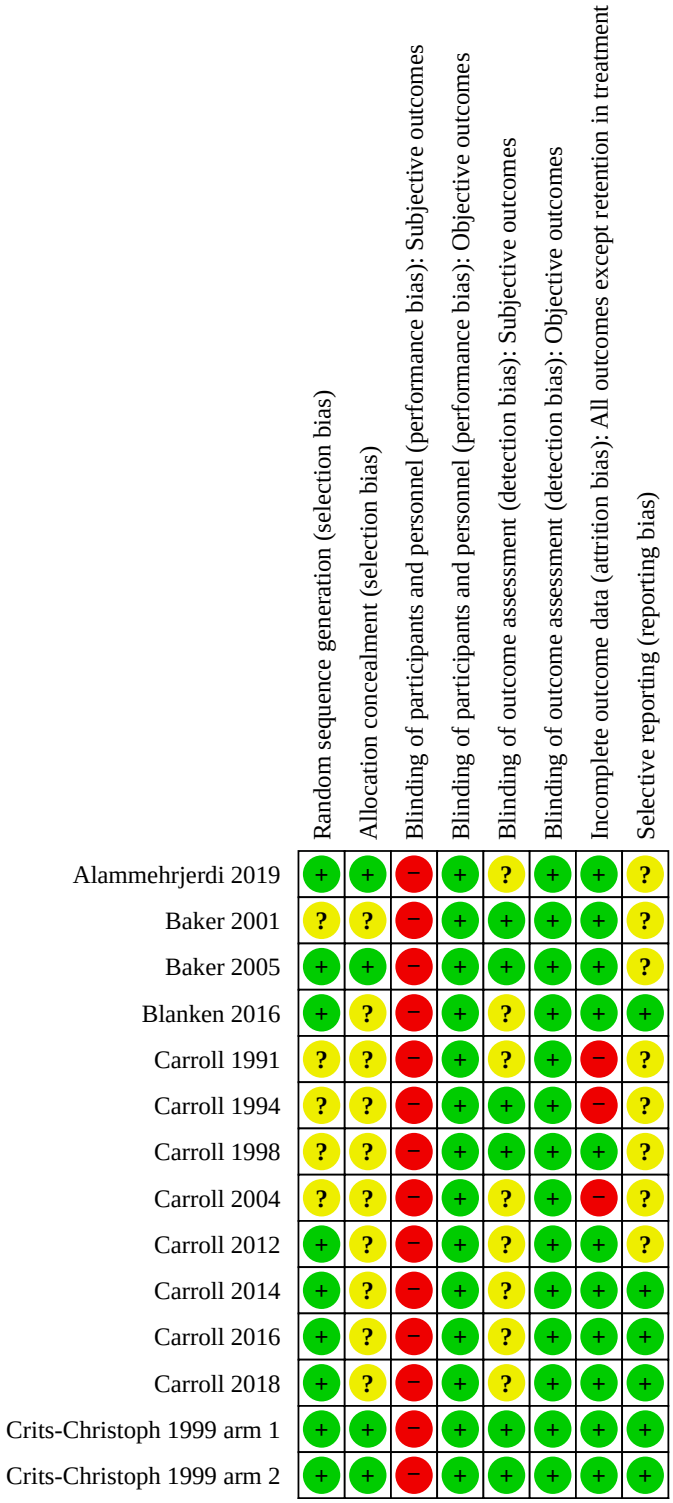


Figure 3. (Continued)

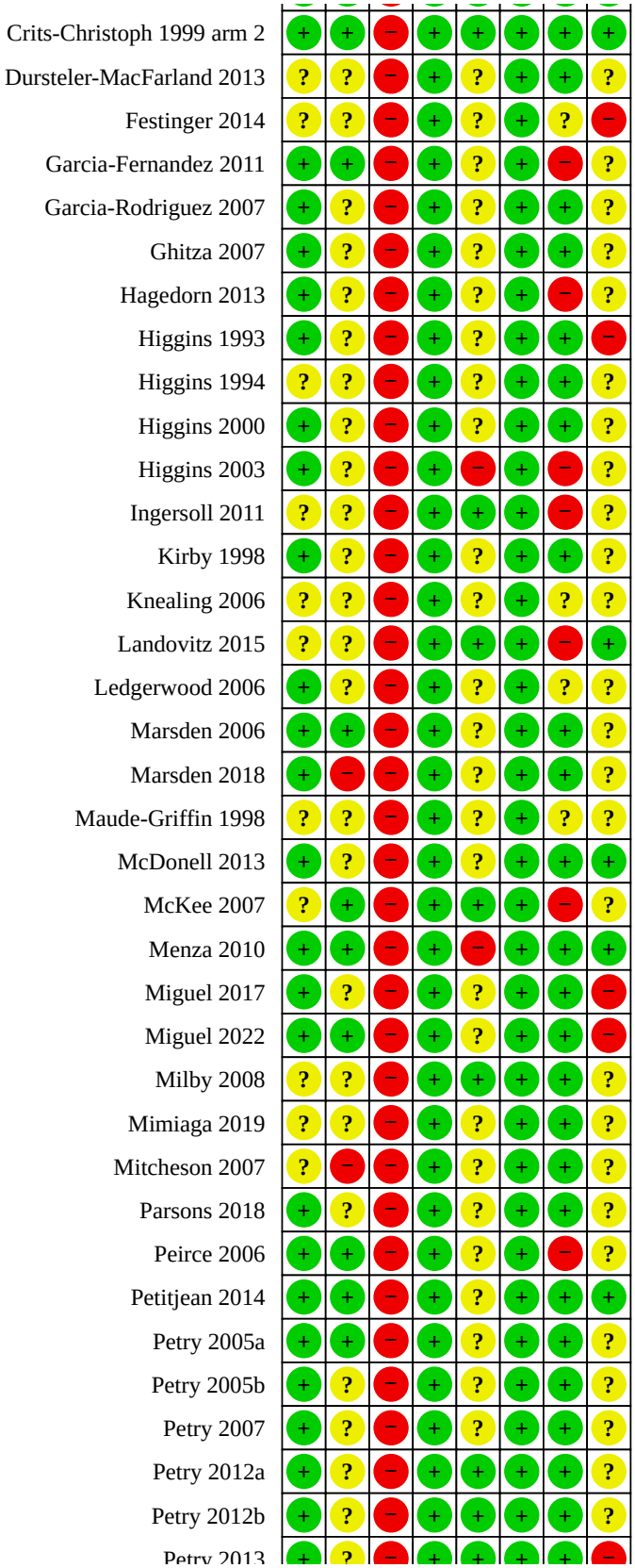
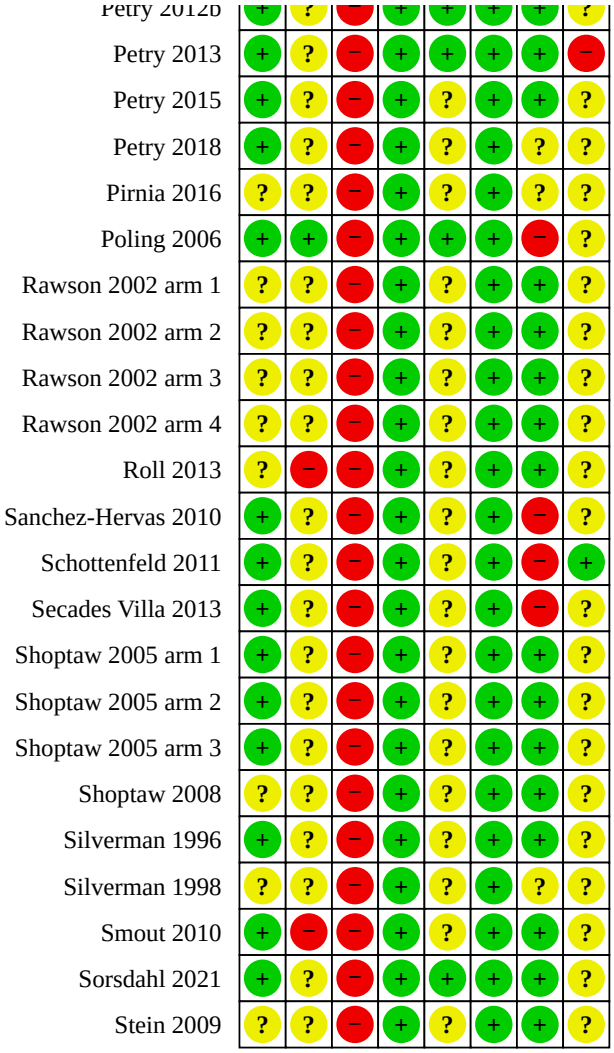


Figure 3. (Continued)



Allocation

Random sequence generation

We judged 42 studies to be at low risk of bias. We rated the remaining 22 studies to have an unclear risk of bias, as authors did not report any information about methods of random sequence generation.

Allocation concealment

We judged 13 studies to be at low risk of bias and four studies to be at high risk of bias; the other studies did not report methods of allocation concealment.

Blinding

Performance bias

We judged all subjective outcomes to be at high risk of bias because blinding of participants and personnel was impossible for the types of intervention studied.

We judged all objective outcomes to be at low risk because we considered that the outcome was not likely to be influenced by lack of blinding.

Detection bias

For subjective outcomes, we considered 14 studies to be at low risk of bias and two studies to be at high risk of bias. The other studies did not report enough information to make a judgement.

We judged all objective outcomes to be at low risk because we considered that these outcomes were unlikely to be influenced by lack of blinding.

Incomplete outcome data

We deemed 43 studies to be at low risk of bias and 14 studies to be at high risk of bias. For the remaining studies, authors did not report information about numbers of and reasons for dropouts, or missing data for each group.

Selective reporting

We judged 11 studies to be at low risk of bias and five studies to be at high risk of bias. Authors of the other studies reported insufficient information to judge the risk of bias.

Other potential sources of bias

We did not consider any other potential sources of bias.

Effects of interventions

See: **Summary of findings 1** Summary of findings table - Any psychosocial intervention compared to no intervention for adults with stimulant use disorder; **Summary of findings 2** Summary of findings table - Any psychosocial intervention compared to treatment as usual (TAU) for adults with stimulant use disorder

Comparison 1. Any psychosocial intervention versus no treatment

Primary outcomes

See Summary of findings 1.

Dropouts from treatment

Based on data from 29 studies involving 4049 participants, compared to no treatment, psychosocial interventions reduce the risk of dropout (risk ratio (RR) 0.82, 95% confidence interval (CI) 0.74 to 0.91; I^2 = 27%; high-certainty evidence; Analysis 1.1).

The subgroup analysis according to percentages of participants in methadone treatment did not show significant differences amongst groups (test for subgroup differences: Chi^2 = 4.93, degrees of freedom (df) 2 (P = 0.08); data not shown).

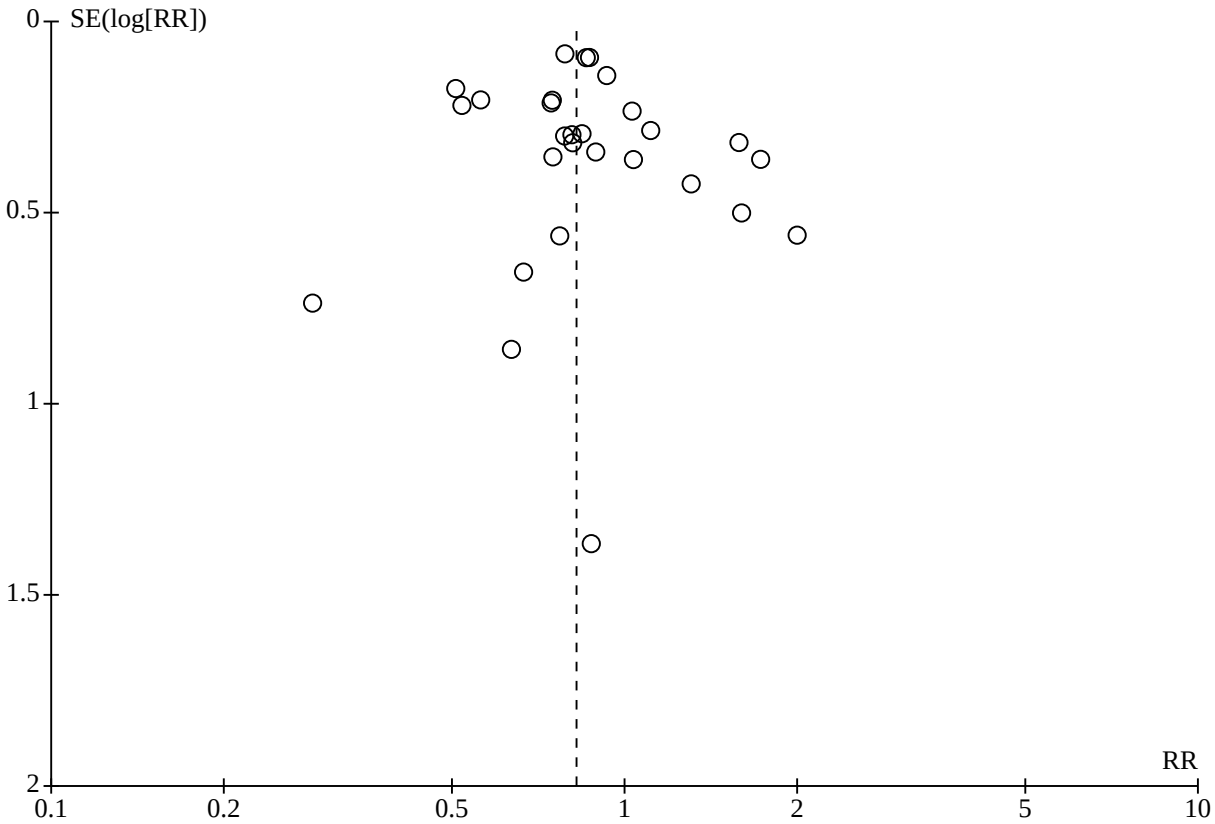
Stratified analysis by intervention type showed evidence of a difference in favour of contingency management.

- *CBT versus no intervention*: little to no difference in dropouts from treatment (RR 0.89, 95% CI 0.68 to 1.17; 8 studies, 851 participants).
- *Contingency management versus no intervention*: results in favour of contingency management (RR 0.76, 95% CI 0.67 to 0.87; 16 studies, 2287 participants).
- *Motivational interviewing versus no intervention*: little to no difference (RR 0.92, 95% CI 0.66 to 1.29; 3 studies, 614 participants).
- *12-step facilitation versus no intervention*: little to no difference (RR 1.58, 95% CI 0.85 to 2.94; 1 study, 112 participants).
- *Psychodynamic therapy versus no intervention*: little to no difference (RR 0.87, 95% CI 0.72 to 1.04; 1 study, 185 participants).

For the above comparisons, see Analysis 1.1.

A visual inspection of the funnel plot did not suggest the presence of publication bias (Figure 4).

Figure 4. Any psychosocial intervention versus no treatment; outcome: dropout from treatment



Point abstinence at end of treatment

Psychosocial interventions make little to no difference to point abstinence at the end of treatment, when compared to no treatment, based on data from 12 studies in 1293 participants (RR 1.15, 95% CI 0.94 to 1.41; I^2 = 45%; high-certainty evidence; Analysis 1.2). The subgroup analysis according to the percentages of participants in methadone treatment did not show significant differences amongst groups (test for subgroup differences: Chi^2 = 0.38, df 1 (P = 0.54); data not shown).

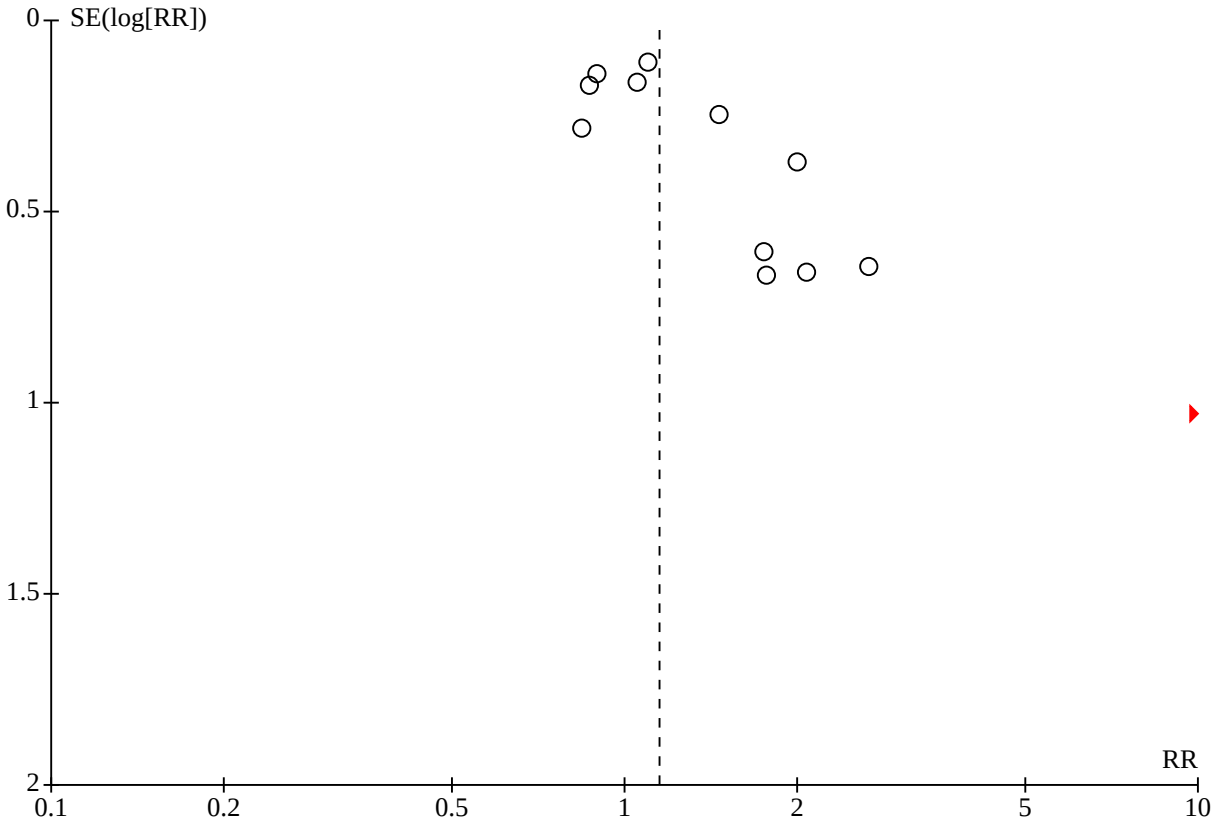
Stratified analysis by intervention type showed evidence of little to no difference for all intervention types.

- *CBT versus no intervention*: RR 1.05, 95% CI 0.88 to 1.25; 4 studies, 454 participants.
- *Contingency management versus no intervention*: RR 1.75, 95% CI 0.92 to 3.34; 5 studies, 507 participants.
- *12-step facilitation versus no intervention*: RR 0.84, 95% CI 0.48 to 1.46; 1 study, 112 participants.
- *Psychodynamic therapy versus no intervention*: RR 1.05, 95% CI 0.77 to 1.44; 1 study, 185 participants.
- *CBT plus contingency management versus no intervention*: RR 2.08, 95% CI 0.57 to 7.55; 1 study, 35 participants.

For the above comparisons, see Analysis 1.2.

A visual inspection of the funnel plot did not suggest the presence of publication bias (Figure 5).

Figure 5. Any psychosocial intervention versus no treatment; outcome: point abstinence at the end of treatment



Point abstinence at longest follow-up

Psychosocial interventions make little to no difference to point abstinence at the longest follow up when compared to placebo, based on data from nine studies involving 1187 participants (RR 1.22, 95% CI 0.91 to 1.62; I^2 = 73%; high-certainty evidence; Analysis 1.3). The subgroup analysis according to percentages of participants in methadone treatment did not show significant differences amongst groups (test for subgroup differences: Chi^2 = 0.63, df 1 (P = 0.43); data not shown).

Stratified analysis by intervention type showed evidence of little to no difference for all intervention types.

- *CBT versus no intervention*: RR 1.78, 95% CI 0.98 to 3.24; 4 studies, 484 participants.
- *Contingency management versus no intervention*: RR 1.06, 95% CI 0.28 to 3.98; 2 studies, 141 participants.
- P*sychodynamic therapy versus no intervention*: RR 0.95, 95% CI 0.72 to 1.27; 1 study, 185 participants.
- *Motivational interviewing versus no intervention*: RR 1.17, 95% CI 0.94 to 1.46; 1 study, 342 participants.
- *CBT plus contingency management versus no intervention:* RR 1.15, 95% CI 0.41 to 3.28; 1 study, 35 participants.

For the above comparisons, see Analysis 1.3.

Continuous abstinence at end of treatment

Psychosocial interventions probably increase the likelihood of continuous abstinence based on data from 12 studies involving 1770 participants (RR 1.89, 95% CI 1.20 to 2.97; I^2 = 76%; moderate-certainty evidence; Analysis 1.4). The subgroup analysis according to percentages of participants in methadone treatment did not show significant differences amongst groups (test for subgroup differences: Chi^2 = 6.18, df 2 (P = 0.05); data not shown).

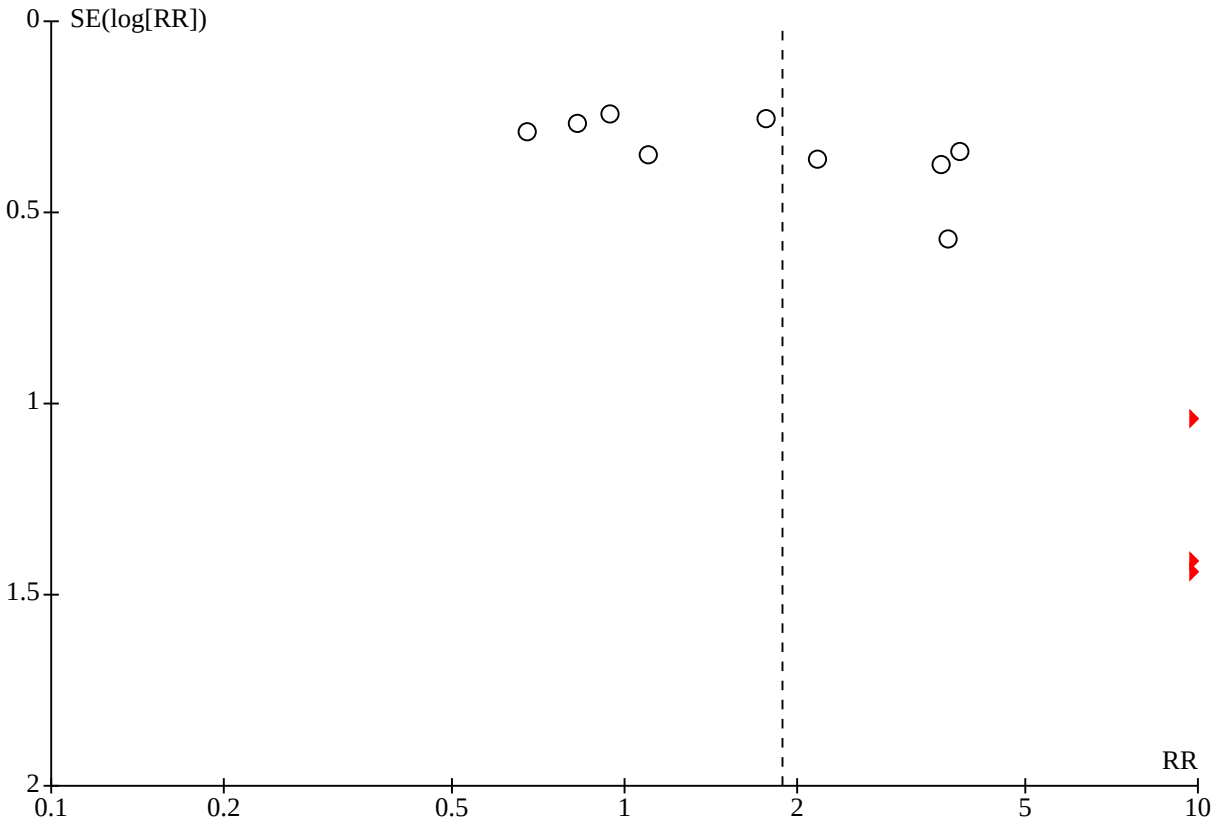
Stratified analysis by intervention type showed evidence of a difference in favour of contingency management.

- *CBT versus no intervention*: little to no difference (RR 1.30, 95% CI 0.51 to 3.34; 2 studies, 282 participants).
- *Contingency management versus no intervention*: results in favour of contingency management (RR 2.51, 95% CI 1.43 to 4.43; 9 studies, 1303 participants).
- *Psychodynamic therapy versus no intervention*: little to no difference (RR 0.68, 95% CI 0.38 to 1.19; 1 study, 185 participants).

For the above comparisons, see Analysis 1.4.

A visual inspection of the funnel plot *did* show asymmetry, suggesting the presence of publication bias (Figure 6).

Figure 6. Any psychosocial intervention versus no treatment; outcome: continuous abstinence at the of treatment



Continuous abstinence at longest follow-up

Psychosocial interventions may make little to no difference to continuous abstinence at the longest follow-up, based on data from three studies in 266 participants (RR 1.14, 95% CI 0.85 to 1.54; I^2 = 36%; low-certainty evidence; Analysis 1.5). The subgroup analysis according to percentages of participants in methadone treatment did not show significant differences amongst groups (test for subgroup differences: Chi^2 = 0.321, df 1 (P = 0.57); data not show).

Stratified analysis by intervention type provided evidence of little to no difference for all intervention types.

- *CBT versus no intervention*: RR 1.16, 95% CI 0.93 to 1.46; 1 study, 85 participants.
- *Contingency management versus no intervention*: RR 1.88, 95% CI 0.33 to 10.61; 2 studies, 181 participants.

For the above comparisons, see Analysis 1.5.

Frequency of drug intake at end of treatment

Psychosocial interventions reduce the frequency of stimulant intake at the end of treatment, based on data from nine studies in 1186 participants (SMD −0.35, 95% CI −0.51 to −0.18; I^2 = 38%; high-certainty evidence; Analysis 1.6). The subgroup analysis according to percentages of participants in methadone treatment did not show significant differences amongst groups (test for subgroup differences: Chi^2 = 3.19, df 2 (P = 0.20); data not shown).

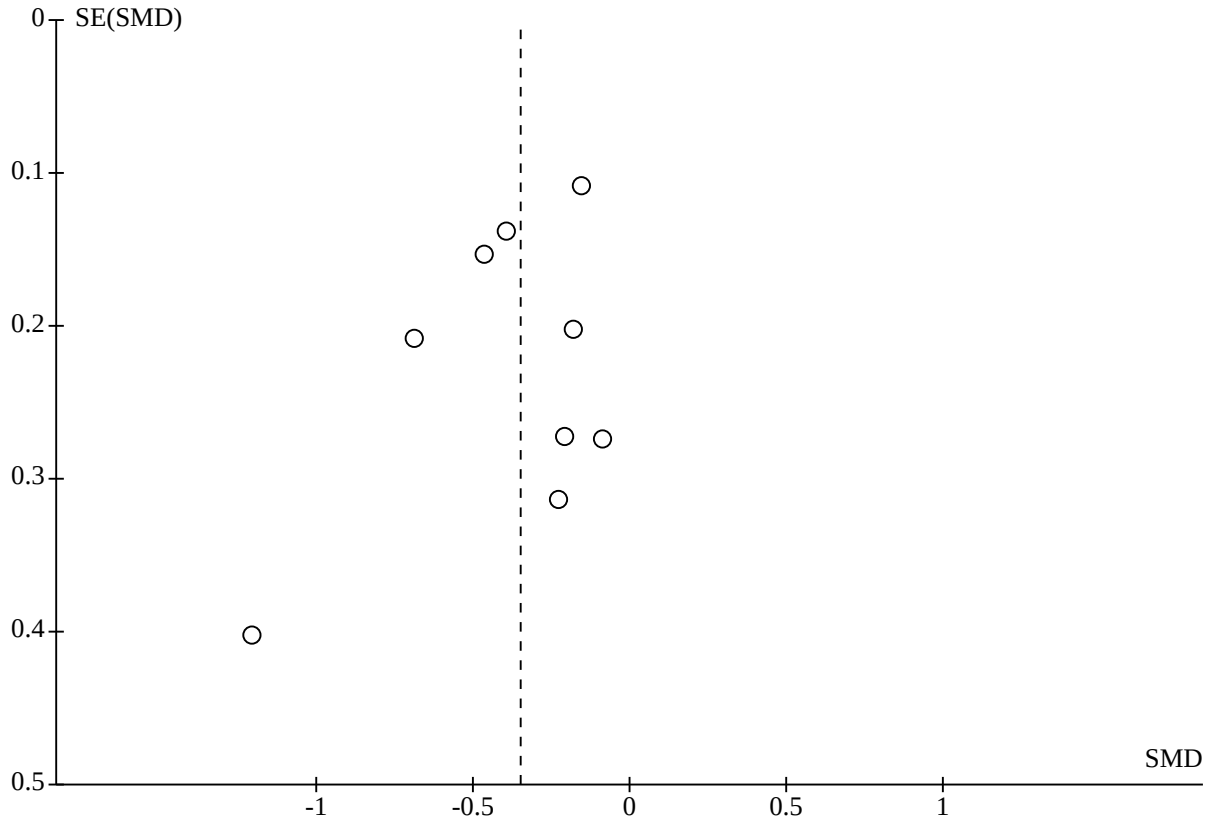
Stratified analysis by intervention type showed evidence of a difference in favour of contingency management.

- *CBT versus no intervention*: little to no difference (SMD −0.49, 95% CI −1.06 to 0.08; 3 studies, 133 participants).
- *Contingency management versus no intervention*: results in favour of contingency management (SMD −0.39, 95% CI −0.56 to −0.22; 5 studies, 711 participants).
- *Motivational interviewing versus no intervention*: little to no difference (SMD −0.15, 95% CI −0.37 to 0.06; 1 study, 342 participants).

For the above comparisons, see Analysis 1.6.

A visual inspection of the funnel plot did not suggest the presence of publication bias (Figure 7).

Figure 7. Any psychosocial intervention versus no treatment; outcome: frequency of drug intake at the end of treatment



Longest period of abstinence at end of treatment

Psychosocial interventions increase abstinence at the end of treatment, based on data from 17 studies in 2018 participants (SMD 0.54, 95% CI 0.41 to 0.68; I^2 = 48%; high-certainty evidence; Analysis 1.7). The subgroup analysis according to percentages of participants in methadone treatment did not show significant differences amongst groups (test for subgroup differences: Chi^2 = 0.39, df 2 (P = 0.82); data not shown).

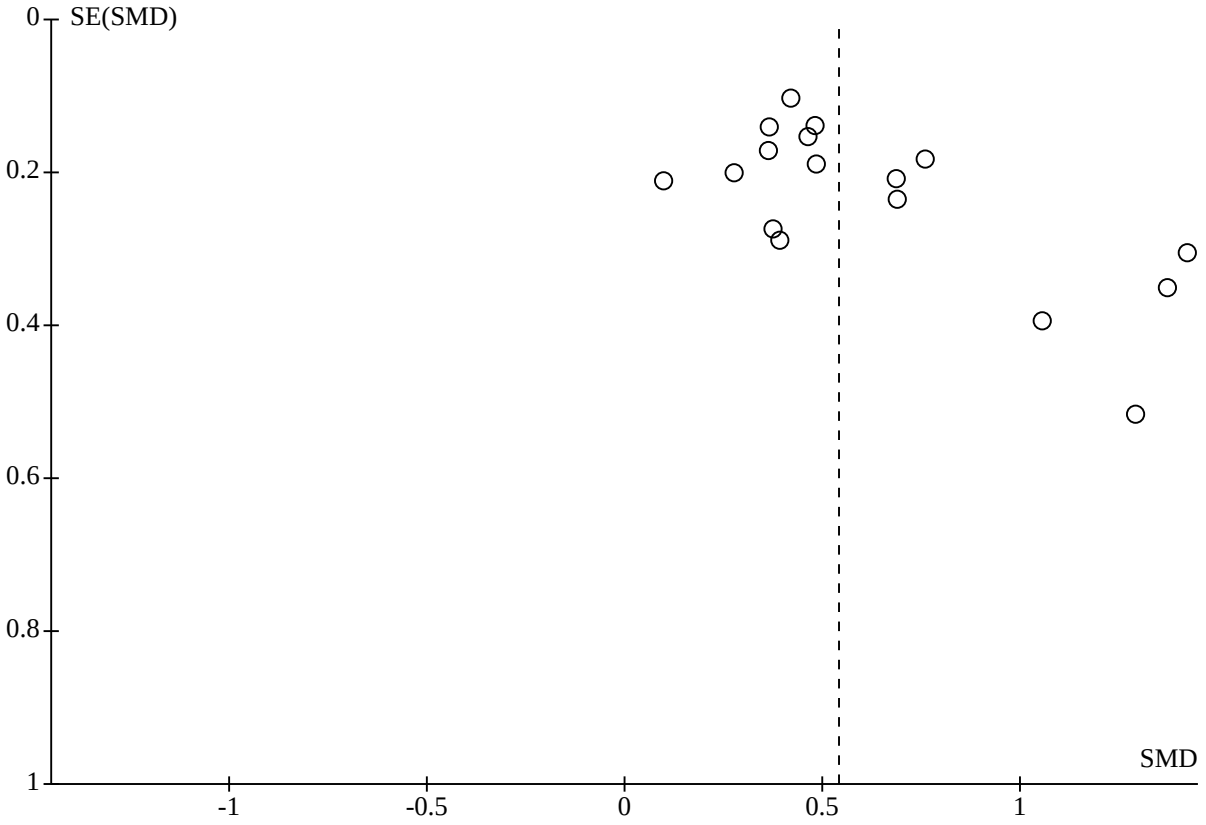
Stratified analysis by intervention type showed a difference favouring CBT and contingency management.

- *CBT versus no intervention*: results in favour of CBT (SMD 0.59, 95% CI 0.23 to 0.94; I^2 =62%; 5 studies, 440 participants).
- *Contingency management versus no intervention*: results in favour of contingency management (SMD 0.54, 95% CI 0.39 to 0.69; I^2 = 45%; 12 studies, 1678 participants).

For the above comparisons, see Analysis 1.7.

A visual inspection of the funnel plot did not suggest the presence of publication bias (Figure 8).

Figure 8. Any psychosocial intervention versus no treatment; outcome: longest period of abstinence



Secondary outcomes

Craving

Compared to no intervention, psychosocial interventions reduce craving, based on data from only three studies with 272 participants (SMD −0.85, 95% CI −1.67 to −0.03; I^2 = 85%; Analysis 1.8).

Stratified analysis by intervention type showed a difference favouring CBT.

- *CBT versus no treatment*: results in favour of CBT (SMD −1.63, 95% CI −2.47 to −0.79; 1 study, 30 participants).
- *Contingency management versus no intervention*: little to no difference (SMD −0.52, 95% CI −1.26 to 0.22; 2 studies, 242 participants).

For the above comparisons, see Analysis 1.8.

Severity of dependence

Compared to no intervention, we found that psychosocial interventions make little to no difference to the severity of participants' dependence, based on data from four studies comparing contingency management to no intervention in 223 participants (SMD −0.83, 95% CI −1.96 to 0.30; I^2 = 92%; Analysis 1.9).

For the above comparisons, see Analysis 1.9.

Depression

Compared to no intervention, we found that psychosocial interventions make little to no difference to depression, based on data from two studies with 78 participants (SMD −0.41, 95% CI −0.86 to 0.04; Analysis 1.10).

Stratified analysis by intervention type provided evidence of little to no difference for both intervention types (i.e. CBT and contingency management).

- *CBT versus no intervention*: SMD −0.28, 95% CI −0.90 to 0.34; 1 study, 41 participants.
- *Contingency management versus no intervention*: SMD −0.56, 95% CI −1.22 to 0.10; 1 study, 37 participants.

For the above comparisons, see Analysis 1.10.

Number of participants with at least one adverse event

Four studies assessed this outcome (Marsden 2018; Petry 2007; Petry 2012b; Petry 2018). Marsden 2018 reported that five of 16 participants in the psychosocial intervention group and one of 14 in the no intervention group had at least one adverse event. The other studies reported that no adverse events occurred.

Comparison 2. Any psychosocial intervention versus treatment as usual (TAU)

Primary outcomes

See Summary of findings 2. We did not perform subgroup analyses according to the percentages of participants in methadone treatment due to the paucity of studies.

Dropouts from treatment

Compared to TAU, psychosocial interventions reduce the risk of dropout, based on data from nine studies involving 735 participants (RR 0.79, 95% CI 0.65 to 0.97; I^2 = 23%; high-certainty evidence; Analysis 2.1).

Stratified analysis by intervention type provided evidence of a difference favouring CBT.

- *CBT versus TAU*: results favour CBT (RR 0.76, 95% CI 0.61 to 0.95; 6 studies, 540 participants).
- *Contingency management versus TAU*: little to no difference (RR 0.74, 95% CI 0.49 to 1.13; 1 study, 82 participants).
- *Motivational interviewing versus TAU*: little to no difference (RR 1.46, 95% CI 0.73 to 2.91; 2 studies, 113 participants).

For the above comparisons, see Analysis 2.1.

Point abstinence at end of treatment

Psychosocial interventions may make little to no difference compared to TAU in point abstinence at end of treatment, based on data from only one study comparing CBT to TAU (RR 1.67, 95% CI 0.64 to 4.31; 1 study, 128 participants; low-certainty evidence; Analysis 2.2).

Point abstinence at longest follow-up

We are uncertain whether psychosocial interventions make any difference compared to TAU in point abstinence at the longest follow-up as the certainty of the evidence was very low (RR 1.31, 95% CI 0.86 to 1.99; I^2 = 0%; 2 studies, 124 participants; Analysis 2.3).

Stratified analysis by intervention type provided evidence of little to no difference for both intervention types (i.e. CBT and motivational interviewing).

- *CBT versus TAU*: RR 1.65, 95% CI 0.86 to 3.18; 1 study, 82 participants.
- *Motivational interviewing versus TAU*: RR 1.11, 95% CI 0.64 to 1.92; 1 study, 42 participants.

For the above comparisons, see Analysis 2.3.

Continuous abstinence at end of treatment

Psychosocial interventions may make little to no difference compared to TAU in continuous abstinence at the end of treatment, based on data from only one study comparing CBT to TAU (RR 1.18, 95% CI 0.92 to 1.53; 1 study, 128 participants; low-certainty evidence; Analysis 2.4).

Continuous abstinence at longest follow-up

None of the studies included in this comparison assessed this outcome.

Frequency of drug intake at end of treatment

Compared to TAU, psychosocial interventions probably make little to no difference to the frequency of drug intake, based on data from four studies with 479 participants (SMD −1.17, 95% CI −2.81 to 0.47; I^2 = 98%; moderate-certainty evidence; Analysis 2.5).

Stratified analysis by intervention type provided evidence of a difference favouring CBT.

- *CBT versus TAU*: results favour CBT (SMD −4.76, 95% CI −5.47 to −4.05; 1 study, 120 participants).
- *Motivational interviewing versus TAU*: little to no difference (SMD −0.25, 95% CI −0.89 to 0.38; 1 study, 39 participants).
- *Motivational interviewing plus CBT versus TAU:* little to no difference (SMD 0.07, 95% CI −0.20 to 0.34; 1 study, 210 participants).
- *Interpersonal therapy versus TAU*: little to no difference (SMD 0.15, 95% CI −0.22 to 0.53; 1 study, 110 participants).

For the above comparisons, see Analysis 2.5.

Longest period of abstinence

Psychosocial interventions may make little to no difference compared to TAU in the longest period of abstinence at the end of treatment, based on data from only one study comparing CBT to TAU (SMD −0.16, 95% CI −0.54 to 0.21; 1 study, 110 participants; low-certainty evidence; Analysis 2.6).

Secondary outcomes

Craving

We found little to no differences in craving between psychosocial interventions and TAU, based on data from one study comparing motivational interviewing to TAU (SMD −0.18, 95% CI −0.81 to 0.46; 1 study, 39 participants; Analysis 2.7).

Severity of dependence

Compared to no intervention, we found that psychosocial interventions make little to no difference to the severity of participants' dependence, based on data from six studies with 509 participants (SMD −0.42, 95% CI −1.15 to 0.32; I^2 = 93%; Analysis 2.8).

Stratified analysis by intervention type provided evidence of little to no difference for all intervention types.

- *CBT versus TAU*:SMD −0.89, 95% CI −2.10 to 0.32; 3studies, 312 participants.
- *Motivational interviewing versus TAU:* SMD 0.02, 95% CI −0.63 to 0.67; 2 studies, 79 participants.
- *Contingency management versus TAU*: SMD 0.18, 95% CI −0.24 to 0.60; 1 study, 118 participants.

For the above comparisons, see Analysis 2.8.

Depression

We found no differences between psychosocial interventions and TAU, based on data from one study on motivational interviewing with 39 participants (SMD −0.16, 95% CI −0.80 to 0.47; Analysis 2.9).

Number of participants with at least one adverse event

One study reported no adverse events (Sorsdahl 2021).

Comparison 3. Contingency management (reinforcement related to abstinence) versus non-contingent management (reinforcement not related to abstinence)

We did not perform subgroup analyses according to percentages of participants in methadone treatment due to the paucity of studies. None of the studies in this comparison reported on three of the review's primary outcomes (i.e. point abstinence at end of treatment, continuous abstinence at longest follow-up, and longest period of abstinence at end of treatment) and three secondary outcomes (i.e. craving, depression, and number of participants with at least one adverse event).

Primary outcomes

Dropouts from treatment

We found little to no differences between contingency management and non-contingent management for the risk of dropout, based on data from six studies involving 704 participants (RR 0.86, 95% CI 0.56 to 1.32; I^2 = 78%; Analysis 3.1).

Point abstinence at longest follow-up

Compared to non-contingency management, we found that contingency management increased the number of participants with point abstinence at the longest follow-up, based on data from two studies in 246 participants (RR 1.43, 95% CI 1.00 to 2.04; I^2 = 30%; Analysis 3.2).

Continuous abstinence at end of treatment

Compared to non-contingency management, we found that contingency management increased the number of participants with continuous abstinence at the end of treatment, based on data from two studies in 96 participants (RR 8.11, 95% CI 1.62 to 40.55; I^2 = 0%; Analysis 3.3).

Frequency of drug intake at longest follow-up

Compared to non-contingency management, we found that contingency management reduced the frequency of drug intake, based on data from one study in 176 participants (SMD −0.67, 95% CI −0.97 to −0.36; Analysis 3.4).

Secondary outcomes

Severity of dependence

We found little to no differences between contingency management and non-contingent management,based on data from one study in 70 participants (SMD 0.16, 95% CI −0.30 to 0.63; Analysis 3.5).

Comparison 4. Single psychosocial intervention versus alternative psychosocial intervention: CBT versus another intervention

We did not perform subgroup analyses for these comparisons according to percentages of participants in methadone treatment due to the paucity of studies. None of the studies in this comparison reported on two of the review's secondary outcomes (i.e. craving and number of participants with at least one adverse event).

Primary outcomes

Dropouts from treatment

We found no differences in the risk of dropouts between CBT and other interventions (see Analysis 4.1).

- *CBT versus interpersonal therapy*:RR 0.54, 95% CI 0.27 to 1.08; 1 study, 42 participants.
- *CBT versus psychodynamic therapy:* RR 0.99, 95% CI 0.83 to 1.18; 1 study, 243 participants.
- *CBT versus 12-step facilitation*: RR 0.87, 95% CI 0.62 to 1.24; 1 study, 145 participants.
- *CBT versus acceptance and commitment therapy (ACT)*: RR 0.94, 95% CI 0.73 to 1.2; 1 study, 104 participants.

Point abstinence at end of treatment

We found no differences in point abstinence at the end of treatment between CBT and other interventions (see Analysis 4.2).

- *CBT versus interpersonal therapy*:RR 1.71, 95% CI 0.84 to 3.48; 1 study, 42 participants.
- *CBT versus psychodynamic therapy:* RR 0.87, 95% CI 0.66 to 1.15; 1 study, 243 participants.
- *CBT versus contingency management*: RR 0.66, 95% CI 0.38 to 1.16; 1 study, 55 participants.
- *CBT versus ACT*: RR 1.29, 95% CI 0.47 to 3.51; 1 study, 26 participants.

Point abstinence at longest follow-up

We found no differences in point abstinence at the longest follow-up between CBT and other interventions (see Analysis 4.3).

- *CBT versus psychodynamic therapy*: RR 1.04, 95% CI 0.82 to 1.32; 1 study, 243 participants.
- *CBT versus contingency management*: RR 1.17, 95% CI 0.73 to 1.87; 1 study, 55 participants.
- *CBT versus ACT*: RR 0.73, 95% CI 0.26 to 2.07; 1 study, 19 participants.

Continuous abstinence at end of treatment

We found no differences in continuous abstinence at the end of treatment between CBT and other interventions (see Analysis 4.4).

- *CBT versus interpersonal therapy*: RR 2.25, 95% CI 0.82 to 6.18; 1 study, 42 participants.
- *CBT versus 12-step facilitation*: RR 1.23, 95% CI 0.89 to 1.70; I^2 = 0%; 2 studies, 225 participants.

Continuous abstinence at longest follow-up

Compared to 12-step facilitation, we found that CBT increased the number of participants with continuous abstinence at longest follow up (RR 1.97, 95% CI 1.00 to 3.86; 1 study, 51 participants; Analysis 4.5).

Frequency of drug intake at longest follow-up

We found no differences in the frequency of drug intake at the longest follow-up between CBT and contingency management (SMD −0.09, 95% CI −0.53 to 0.34; 1 study, 82 participants; Analysis 4.6).

Longest period of abstinence

Compared to CBT, we found that contingency management increased the longest period of abstinence, based on one study with 82 participants (SMD −0.79, 95% CI −1.24 to −0.34; Analysis 4.7).

Secondary outcomes

Severity of dependence

We found no differences in the severity of participants' dependence between CBT and ACT (SMD −0.02, 95% CI −0.40 to 0.37; 1 study, 104 participants; Analysis 4.8).

Depression

We found no differences in participants' depression between CBT and ACT (SMD 0.18, 95% CI −0.21 to 0.56; 1 study, 104 participants).

Sensitivity analysis

We did not perform sensitivity analysis by excluding studies at high risk of selection, detection, or attrition bias, because our visual inspections of the forest plots indicated that studies at high risk of bias were few and had a low weight in the overall estimates.

DISCUSSION

Summary of main results

We included 64 trials (8241 participants) that considered cognitive behavioural therapy (CBT), contingency management, motivational interviewing, a combination of CBT and contingency management, a combination of CBT and motivational interviewing, interpersonal therapy, psychodynamic therapy, and 12-step facilitation. Most of the studies either compared psychosocial treatments to no intervention, or compared psychosocial treatment plus treatment as usual (TAU) to TAU alone. The psychosocial intervention most studied was contingency management, followed by CBT.

When compared to no intervention, we found that psychosocial treatments reduce participants' risk of leaving the study prematurely, increase the longest period of abstinence, and reduce the frequency of drug intake (high-certainty evidence). We also found that they probably increase continuous abstinence at the end of treatment (moderate-certainty evidence), but that these results may not be maintained at the longest follow-up (low-certainty evidence). Results in the subgroup analyses according to percentages of participants in methadone treatment did not show significant differences in any of the primary outcomes. It should be noted that most of the studies in this comparison assessed the efficacy of a specific psychosocial treatment added to TAU or to another specific psychosocial or pharmacological treatment received by both groups. Thus, in this comparison, many of the control participants were not really untreated. Receiving some amount of treatment is not the same as receiving no intervention. Thus, it is possible that the overall effect of an experimental psychosocial treatment is smaller when the intervention is given as an add-on to TAU or to another intervention than when it is given to participants not receiving any intervention. For this reason, the effect of the psychosocial interventions could be of a smaller magnitude when given as an add-on, underestimating the true effect of psychosocial interventions. The same is not true for motivational interviewing, which was almost always compared with informative handouts only.

When compared to TAU, we found that psychosocial treatments reduce participants' risk of leaving the study prematurely (high-certainty evidence), but that they may make little to no difference in continuous abstinence at the end of treatment and to the longest period of abstinence (low-certainty evidence). They also probably make little to no difference in the frequency of drug intake at the end of treatment (moderate-certainty evidence).

Considering different psychosocial interventions, the most studied and effective approach when compared to no intervention or TAU was contingency management. However, the other approaches were analysed only by a few small studies, so we cannot rule out the possibility that the results were imprecise due to small sample sizes.

We grouped the studies that compared two different types of psychosocial approaches to each other into two comparisons: (1) contingency management (reinforcement related to abstinence) versus not contingency management (reinforcements not related to abstinence); and (2) single psychosocial intervention versus an alternative psychosocial intervention. In the first comparison, reinforcement related to abstinence (contingency management) was found to be effective in reducing psychostimulant use compared to reinforcement not contingent on abstinence (not contingency management). In the second comparison, CBT was compared to different psychosocial approaches, and we found differences in only two outcomes, both based on single-study comparisons.

Overall completeness and applicability of evidence

There is no widely accepted definition of psychosocial interventions (Committee 2015). In this update, we considered only the interventions that were included in the previous version. Accordingly, our conclusions cannot be applied to other interventions not assessed in this review.

Contingency management is the most studied treatment and – perhaps for this reason – the one with the greatest evidence of efficacy. It is a widely used treatment in the USA but is difficult to implement in some European countries, especially those with a public national health service, mainly for organisational and ethical reasons.

Most studies took place in the USA. This geographic concentration could limit the generalisability of the results as the effects of psychosocial treatments could be influenced by the social context and ethnicity.

We found few studies directly comparing two different types of psychosocial approaches; the comparisons were heterogeneous; and the sample sizes were small. Therefore, our results cannot be considered conclusive.

One criticism by frontline healthcare workers might be that people under the acute effect of stimulants may not be in a position to sustain any conversation, thus limiting the (potential) effectiveness of psychosocial interventions. Nevertheless, the results of the present systematic review show that psychosocial treatments can help people with stimulant use disorder by reducing the risk of dropout. In other words, they can help people with stimulant use disorder while they are not under the acute effect of these drugs.

Finally, we did not assess treatment fidelity in this review. Therefore, it is possible that the small or null effects observed in some outcomes could be ascribed to the fact that the psychosocial interventions were inadequately delivered.

Certainty of the evidence

The studies could not blind participants and personnel delivering the intervention; therefore, they are all at high risk of performance bias. However, all the primary outcomes concerning drug use were verified by urine analysis in most of the studies. An important limitation of the studies was the poor reporting on methods, which limited the assessment of risk of bias. We judged about 75% of the studies to have an unclear risk of bias for allocation concealment and blinding of outcome assessor. In addition, for about 75% of the studies, the protocol was not available. Another important limitation is the imprecision of the estimates in the comparison of any psychosocial intervention versus TAU.

Potential biases in the review process

We assessed the risk of publication bias by inspecting the funnel plots for five primary outcomes in the comparison of any psychosocial intervention to no intervention only. In the other comparisons, there were too few studies to make the funnel plot informative. We found evidence suggesting the possibility of publication bias only for the outcome of continuous abstinence at the end of treatment.

We searched several databases and performed a systematic search of ongoing clinical trials and unpublished trials on the websites ClinicalTrials.gov (clinicaltrials.gov), and the World Health Organization (WHO) International Clinical Trials Registry Platform (ICTRP) (apps.who.int/trialsearch/). Therefore, we believe the risk of having missed negative studies is small.

Agreements and disagreements with other studies or reviews

Results from the present review expand previous findings supporting the use of psychosocial interventions for the treatment of people with stimulant use disorder. National Institute for Health and Care Excellence (NICE) guidelines recommend considering psychosocial interventions, such as CBT, psychodynamic therapy, and contingency management (NICE 2007). A review in individuals with substance use disorder highlighted the effectiveness of contingency management in people with cocaine use disorder (Secades Villa 2015).

Two systematic reviews published in 2021 assessed the efficacy of psychosocial interventions for the treatment of adults with cocaine use disorder and amphetamine-type stimulant use disorder, respectively (Bentzley 2021; Tran 2021). The Bentzley 2021 review considered psychotherapy, contingency management, and pharmacological treatments. The primary outcome of the review was the reduction of urinalysis-confirmed cocaine use at the end of the treatment compared to baseline. All types of psychotherapies were considered together, apart from contingency management, which was analysed separately. Only contingency management programmes were found to be associated with a significant increase in the likelihood of negative urine analyses at the end of treatment compared to baseline. However, the review's authors obtained this result by performing an intra-group analysis comparing urinalysis results at baseline and at the end of treatment within each treatment arm, including placebo, and not across groups. Furthermore, the authors did not assess the risk of bias of the included studies and included any clinical trials, not only RCTs. Nevertheless, their finding of a positive effect induced by contingency management in increasing the likelihood of negative urine analyses for cocaine use is in agreement with our finding that contingency management reduces the frequency of stimulant intake.

The Tran 2021 review, an overview of systematic reviews using a meta-analytic approach, found that psychosocial interventions decreased the proportion of participants who used amphetamine-type stimulants at the end of treatment compared to no treatment or TAU. In this analysis, psychosocial interventions comprised contingency management, CBT, and combinations of different psychosocial therapies. This review also found that psychosocial interventions decreased the number of days using amphetamine-type stimulants compared to no treatment or TAU, in the month following the end of treatment. In this analysis, the psychosocial interventions included different combinations compared to CBT and CBT compared to no treatment. Globally, these findings are in agreement with our finding that psychosocial interventions increase the continuous abstinence at the end of treatment. Finally, this review found that psychosocial interventions increase compliance with treatment. In this analysis, contingency management was compared to no contingency management and CBT to TAU. This finding is in agreement with our finding that psychosocial interventions reduce the risk of leaving treatment before its end. However, in our systematic review, we included participants with stimulant use disorder by any psychostimulants, and we compared the efficacy of psychosocial interventions to no treatment and TAU in two different analyses.

A network meta-analysis comparing the efficacy of different psychosocial treatments for cocaine and amphetamine use disorders published in 2018 concluded that the most effective approach, when compared to TAU, was contingency management combined with a community reinforcement approach (De Crescenzo 2018). A 2023 meta-review evaluated the efficacy of psychosocial therapies for the treatment of substance use disorders, and concluded that contingency management and CBT show small effects for the treatment of stimulant use disorder (Dellazizzo 2023). These results are in agreement with the results derived from our analyses, stratified by type of treatment, showing that contingency management appears to be the most promising approach.

AUTHORS' CONCLUSIONS

Implications for practice

This review's findings indicate that psychosocial treatments can help people with stimulant use disorder by reducing dropout rates. This conclusion is based on high-certainty evidence from comparisons of psychosocial interventions with both no treatment and TAU. This is an important finding because many people with stimulant use disorders leave treatment prematurely. Stimulant use disorders are chronic, lifelong, relapsing mental disorders, which require substantial therapeutic efforts to achieve abstinence. For those who are not yet able to achieve complete abstinence, retention in treatment may help to reduce the risks associated with stimulant use. In addition, psychosocial interventions reduce

stimulant use compared to no treatment, but they may make little to no difference to stimulant use when compared to TAU.

The most studied and promising psychosocial approach is contingency management. Relatively few studies explored the other approaches, so we cannot rule out the possibility that the results were imprecise due to small sample sizes.

Implications for research

This field would benefit from future research that:

- compares two different types of psychosocial intervention, as few existing studies do this, the comparisons are heterogeneous, and the samples size small;
- focuses on psychosocial interventions besides contingency management, which is the most studied approach;
- is conducted outside the USA to explore the applicability of these results, derived mainly from American studies;
- explores the effect of the different psychosocial approaches in key subgroups: people of all genders; consumers of single stimulants; people with additional diagnoses of other substance use disorders; and those with comorbid psychiatric disorders.

In future updates of this review, we will consider expanding the review's scope in the following ways:

- including other psychosocial treatments used in clinical practice;
- analysing factors that potentially influence treatment efficacy; and
- considering the question of tailoring treatment to the needs of different subgroups of people who use stimulants.

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- Sign-off Editor (provided editorial guidance to authors, final editorial decision): Marica Ferri, MSc, PhD, European Monitoring Centre for Drugs and Drug Addiction (EMCDDA), Praça Europa, Lisbon, Portugal
- Managing Editor (selected peer reviewers, collated peer-reviewer comments): Zuzana Mitrova, Cochrane Drugs and Alcohol
- Copy Editor (copy editing and production): Faith Armitage, Cochrane Central Production Service
- Peer reviewers (provided comments and recommended an editorial decision): Dr Alison K. Beck, Clinical Psychologist and Postdoctoral Research Fellow School of Psychology Faculty of the Arts, Social Sciences and Humanities University of Wollongong, NSW, Australia (clinical/content review); Takayuki Harada, Faculty of Human Sciences, University of Tsukuba, Tokyo, Japan (clinical/content review)

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* Indicates the major publication for the study

CHARACTERISTICS OF STUDIES

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

Alammehrjerdi 2019

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: Iran

Alammehrjerdi 2019 *(Continued)*

	Participants: Iranian methadone-maintained women **N =** 120 women **Age**: not reported **Sex**: females (100%) **Ethnicity**: not reported **Marital status:** not reported **Education level:** not reported **Employment:** not reported **Setting**: outpatients (four methadone treatment services located in Tehran, Iran) **History**: • Route: not reported • Psychostimulant use: regular methamphetamine use; baseline methamphetamine items of the Opiate Treatment Index (OTI; mean (SD) BCBT = 1.3 (0.47); Control = 1.2 (0.44) • Other drugs: 100% methadone-maintained women • Psychiatric comorbidity: not reported
Interventions	1. Brief cognitive behavioural therapy condition (BCBT, n = 60), 2. Non-BCBT control condition (control, n = 60) **Duration of intervention:** 4 weeks; four weekly sessions **Duration of follow-up:** three-month follow-up (week 12)
Outcomes	• Dropout • Abstinence • Frequency of drug intake • Severity of dependence
Notes	**Funding source:** the authors thank the National Drug and Alcohol Research Centre **Conflict of interest**: not reported

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "a statistician conducted block randomization by using STATA software. The random allocation sequence was generated and stratified by study site."
Allocation concealment (selection bias)	Low risk	Quote: "The statistician who conducted the randomization placed the printed codes in envelopes and gave them to the principal investigator (PI). The PI gave sequentially numbered, opaque, sealed envelopes to a clinical psychologist for group allocation at each study site. The clinical psychologist was blind to the codes inside the envelopes before opening them."
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention

Alammehrjerdi 2019 *(Continued)*

Blinding of participants and personnel (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 outcome assessment (detection bias) Subjective outcomes	Unclear risk	Quote: "One clinical psychologist conducted the treatment sessions and another conducted the control sessions. One psychologist completed the study assessments at baseline and post-treatment, and one psychologist completed assessments at follow-up. Before conducting the study, the research staff were trained and participants were reminded by the psychologists not to discuss the sessions with other patients and methadone staff."
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	Unclear information, but the review authors judge that the outcome is not likely to be influenced by lack of blinding.
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	No dropout from the study
Selective reporting (reporting bias)	Unclear risk	N° of protocol provided not found in the Iranian Registry of Clinical Trials

Baker 2001

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: Australia **Participants**: Regular users of amphetamines **N** = 64 **Age**: 32 years old (mean age) **Sex**: Males 62% **Ethnicity**: Not reported **Marital status**: Not reported **Education level**: 10.5 years (mean) **Employment**: Not reported **Setting**: Outpatients **History**: • Route: not reported • Psychostimulant use: mean daily level of amphetamine use (OTI score): control: 0.83 (SD 1.03); intervention group: 1.20 (SD 1.65). • Other drugs: reported use of cannabis, tobacco, and unspecified polydrug. 36.5% in methadone maintenance • Psychiatric comorbidity: not reported
Interventions	1. CBT (RP Brief) (2 or 4 sessions) + self-help booklet on reducing amphetamine use and related harms (n = 32) 2. Self-help booklet only (n = 32)

Baker 2001 *(Continued)*

	Duration of intervention: Not reported **Duration of follow-up**: 6 months
Outcomes	• Dropouts • Use of cocaine at 6-month follow-up
Notes	**Funding source**: Research Management Committee (RMC) grant from the University of Newcastle **Conflict of interest**: Not stated RP: individual sessions guided by a therapist

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Information not reported
Allocation concealment (selection bias)	Unclear risk	Information not reported
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention
Blinding of participants and personnel (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 outcome assessment (detection bias) Subjective outcomes	Low risk	Quote: "Follow-up assessments were conducted by an interviewer blind to the subject's group allocation"
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	Quote: "Follow-up assessments were conducted by an interviewer blind to the subject's group allocation"
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	18.7% withdrew from the study; no significant difference in retention rates across groups. Analysis of data on the same key prognostic variables above indicated that there were no significant differences between participants who were followed up (n = 52) and participants who were not followed up (n = 12).
Selective reporting (reporting bias)	Unclear risk	Information about protocol not reported; outcomes not clearly described in the Methods section; raw data not reported for the majority of the outcomes

Baker 2005

Study characteristics

Methods	Randomised controlled trial
Participants	**Country**: Australia

Baker 2005 *(Continued)*

	Participants: 214 regular users of amphetamines recruited from the Newcastle region (n = 98) of New South Wales and from the Greater Brisbane Region of South-East Queensland (n = 116), Australia **N** = 214 **Age**: 30.22 years old (mean age) **Sex**: males 62.6% **Ethnicity**: not reported **Marital status**: not reported **Education level**: not reported **Employment**: not reported **Setting**: outpatients **History** • Route: not reported • Psychostimulant use: mean duration of regular use was 8.98 years (SD 6.99); OTI drug use score for amphetamines: 1.55 (SD 1.61) pre-treatment (n = 214); polydrug use: 4.31 (SD 1.46) • Psychiatric comorbidity: mental health % ever diagnosed/treated: 47.7% (n = 102); currently taking medication for mental health: 41.6% (n = 89)
Interventions	The primary study had the following arms: 1. 2-session CBT (n = 74) + self-help booklet 2. 4-session CBT (n = 66) + self-help booklet 3. Control (n = 74) self-help booklet In this review, we compared the combination of groups 1 and 2 (intervention) versus group 3 (control). **Duration of intervention**: 5 weeks following pre-treatment assessment **Duration of follow-up**: 6 months following the post-treatment assessment
Outcomes	• Changes in amphetamine use • Abstinence rates
Notes	**Funding source**: Commonwealth Department of Health and Ageing **Conflict of interest**: not stated

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "A nine-block randomization schedule was used, which was coordinated by an independent clinical trials researcher. The sample was stratified by location, gender and maintenance pharmacotherapy status for heroin dependence"
Allocation concealment (selection bias)	Low risk	Quote: "randomization schedule was used, which was coordinated by an independent clinical trials"
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention
Blinding of participants and personnel (performance bias)	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

Baker 2005 *(Continued)*

Objective outcomes		
Blinding of outcome assessment (detection bias) Subjective outcomes	Low risk	Quote: "Assessments were conducted by trained interviewers who were blind to participants' treatment allocation"
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	Quote: "Assessments were conducted by trained interviewers who were blind to participants' treatment allocation"
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	ITT analysis performed. Missing outcome data coded non-abstinent
Selective reporting (reporting bias)	Unclear risk	Protocol of the study was not available

Blanken 2016

Study characteristics	
Methods	Multicenter, open-label, parallel-group, randomised controlled trial
Participants	**Country**: the Netherlands **Participants**: treatment-refractory heroin-dependent who started heroin-assisted treatment (HAT) with frequent cocaine use **N =** 214 **Age**: 44.1 (mean age) **Sex**: males 85.1% **Ethnicity**: Dutch/western 69.5% **Marital status**: not reported **Education level**: not reported **Employment:** source of income: welfare/public assistance 73.1% **Setting**: outpatients **History**: • Route: not reported • Psychostimulant use: a long history of regular heroin (20.6 years) and cocaine (16.6 years) use • Other drugs: amphetamines, benzodiazepines, and alcohol • Mental health problems assessed by the Symptom Check-list 90 items (SCL-90): 74.3% of the included participants exhibited a score on SCL-90 greater than or equal to 60 in males and greater than or equal to 40 in females
Interventions	Routine, daily supervised (injectable or inhalable) diacetylmorphine treatment, co-prescribed with oral methadone (HAT), with and without 6 months of contingency management (CM) for cocaine use as an add-on intervention 1. HAT + CM (n = 107)

Blanken 2016 *(Continued)*

	2. HAT-only (n = 107) **Duration of intervention:** 6 months **Duration of Follow-up:** 6 months naturalistic follow-up phase
Outcomes	• Dropout • Frequency of drug intake • Longest period of abstinence • Cocaine craving
Notes	**Funding source:** "The trial was commissioned and funded by the Ministry of Health, Welfare and Sports of the Netherlands. The funder was not involved in the design of the study, the implementation of the study, the analyses of the results, nor in writing the manuscript." **Conflict of interest**: "All authors were part of the research team of the Central Committee on the Treatment of Heroin Addicts (CCBH), that designed, conducted and reported on the heroin trials in The Netherlands. All authors have completed the ICMJE uniform disclosure format www.icmje.org/coi disclosure.pdf (available on request from the corresponding author) and all authors report grants from Netherlands Ministry of Health, Welfare and Sports, during the conduct of the study. VMH reports personal fees from Lundbeck, outside the submitted work. WvdB reports personal fees from Lundbeck, Merck Serono, Reckitt Benckiser, Eli Lilly, Pfizer, and Schering Plough, and grants from Alkermes, outside the submitted work. All authors report no relationships or activities that could appear to have influenced the submitted work."

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "computer generated block-assignment, with a 1:1 ratio in blocks of 2 per stratum. Randomization was stratified by treatment center and, to ensure a similar distribution of patients with low and high frequency cocaine use in both treatment conditions, randomization was pre-stratified by the level of recent cocaine use (≤ 26 versus > 26 days in the month before randomization; the 70th percentile)."
Allocation concealment (selection bias)	Unclear risk	No information provided
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	Information not reported
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	Information not reported; however, objective outcomes unlikely to be biased by lack of blinding
Incomplete outcome data (attrition bias)	Low risk	ITT analysis performed. Missing outcome data coded non-abstinent

Blanken 2016 *(Continued)*

All outcomes except retention in treatment		
Selective reporting (reporting bias)	Low risk	Protocol available. All the outcomes listed in the study protocol were also reported in the results section of the article

Carroll 1991

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: cocaine abusers (DSM-III) **N** = 42 **Age**: 27 years old (mean age) **Sex**: males 74% **Ethnicity**: white 76.2% **Marital status**: married 17.5% **Education level**: 13 years (mean) **Employment**: employed 65% **Setting**: outpatients **History**: • Route: 33.3% freebase, 50% intranasal • Psychostimulant use: ~ 4 g per week, for approximately 40 months • Other drugs: 31% of participants also report regular use of other substances (alcohol 87.5%, marijuana 37.5%) • Psychiatric comorbidity: depressive disorders (19%), antisocial personality disorders (26%)
Interventions	1. CBT (RP) (n = 21) 2. Interpersonal therapy (IPT) (n = 21) **Duration of intervention**: both interventions consisted of individual sessions of 50 to 60 minutes once a week for 3 months **Duration of follow-up**: 3 months
Outcomes	• Dropouts • Use of cocaine for at least 3 consecutive weeks at any point of treatment • Use of cocaine for at least 3 consecutive weeks at endpoint of study
Notes	**Funding source**: National Institute on Drug Abuse Grant DA 04299 **Conflict of interest**: not stated
Risk of bias	

Carroll 1991 *(Continued)*

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Information not reported
Allocation concealment (selection bias)	Unclear risk	Information not reported
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	No information reported
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	High risk	45% of participants dropped out from the study. Imbalance between groups: 33% RP, 62% IPT
Selective reporting (reporting bias)	Unclear risk	Protocol not available

Carroll 1994

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: cocaine use/dependence (DSM-III-R) **N** = 110 (139 randomised; 121 initiated treatment but only 110 analysed) **Sex**: males 63% **Age**: 28.8 years old (mean age) **Ethnicity**: "minority" 54% **Marital status**: married 29% **Education level**: at least 12 years of education 76% **Employment**: employed 53% **Setting**: outpatients **History**: • Route: 62% freebase, 29% intranasal, 9% intravenous

Carroll 1994 *(Continued)*

	• Psychostimulant use: 4.4 (SD 3.3) g of cocaine use per week; years of use: mean of 4.2 years; previous treatments: 30% of participants • Other drugs: 48% lifetime alcohol dependence • Psychiatric comorbidity: 20% lifetime affective disorder, 13% lifetime anxiety disorder, 49% antisocial personality disorder, 65% any other personality disorder
Interventions	Pharmacotherapy (desipramine hydrochloride or placebo) and psychotherapy in a 2 x 2 design 1. CBT (n = 58) 2. Clinical management (n = 52) **Duration of intervention**: psychosocial interventions were manual-guided and provided weekly in individual sessions over 3 months **Duration of follow-up**: 3 months
Outcomes	• Dropouts • Mean percent of abstinence days • Mean number of sessions attended by depressed cocaine abusers • Mean number of sessions attended by euthymic cocaine abusers
Notes	**Funding source**: National Institute on Drug Abuse. Bethesda, MD **Conflict of interest**: not stated

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Information not reported
Allocation concealment (selection bias)	Unclear risk	Information not reported
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Low risk	Quote: "to maintain a single blind for psychotherapy, the clinical evaluator saw subjects in an office physically separated from the office in which therapy was conducted and instructed subjects not to disclose details of their therapist or treatment"
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	Quote: "to maintain a single blind for psychotherapy, the clinical evaluator saw subjects in an office physically separated from the office in which therapy was conducted and instructed subjects not to disclose details of their therapist or treatment"
Incomplete outcome data (attrition bias)	High risk	139 randomised (the initial allocation to each group not reported); 121 initiated treatment but only 110 analysed. 33% dropout at 3 months (12 weeks), balanced across groups (34 CBT and 32 clinical management)

Carroll 1994 *(Continued)*

All outcomes except retention in treatment		
Selective reporting (reporting bias)	Unclear risk	Protocol not available

Carroll 1998

Study characteristics	
Methods	Randomised controlled trial

Participants	**Country**: USA
	
	Participants: cocaine dependence with comorbid alcohol dependence or abuse (DSM-III-R)
	
	N = 122
	
	Sex: males 73%
	
	Age: 30.8 years old (mean age)
	
	Ethnicity: African American 56%, white 39%, Latino 3%, other 2%
	
	Marital status: married 41%
	
	Education level: completed some college 23% (47% high school, 30% did not complete high school)
	
	Employment: employed 43%
	
	Setting: outpatient
	
	History:
	
	• Route: 77% freebase, 20% intranasal, 3% intravenous
	• Psychostimulant use:
	  ◦ Mean 4.0 (SD 5.1) g of cocaine per week
	  ◦ Days of use: mean of 14.1 (SD 8.1) days of the past 30 days of cocaine use
	  ◦ Years of cocaine dependence: 7.5 (4.4) years.
	  ◦ Previous exposure to treatment: 53%
	• Other drugs: alcohol use: mean of 17.2 days of the past 30 days, with a mean of 11.6 (SD 8.1) standard drinks (SDU) per drinking occasion; years of alcohol abuse: 7.3 (SD 6.2)
	• Psychiatric comorbidity: excluded participants currently physically dependent on opiates or barbiturates, or whose principal drug of dependence was not cocaine

Interventions	The primary study had the following arms: 1. CBT (relapse prevention coping skills training) alone (n = 18) 2. CBT plus disulfiram (n = 24) 3. TSF, adapted from Project MATCH alone (n = 23) 4. TSF plus disulfiram (n = 25) 5. Clinical management plus disulfiram (n = 27) In this review, we compared the combination of groups 1 and 2 versus the combination of groups 3 and 4. We did not consider group 5. Treatments: each of the study treatments was manual-guided and delivered in weekly individual sessions.

Carroll 1998 *(Continued)*

	Duration of intervention: 3 months Disulphiram: 250 to 500 mg/day. Modal dose 261.5 mg/day **Duration of follow-up**: 3 months
Outcomes	• Abstinence from cocaine for at least 3 consecutive weeks • Abstinence from cocaine and alcohol for 3 consecutive weeks
Notes	**Funding source**: National Institute on Drug Abuse **Conflict of interest**: not stated Weekly individual sessions

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Information not reported
Allocation concealment (selection bias)	Unclear risk	Information not reported
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention
Blinding of participants and personnel (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 outcome assessment (detection bias) Subjective outcomes	Low risk	Quote: "to maintain a single blind for psychotherapy, the clinical evaluator saw subjects in an office physically separated from the office in which therapy was conducted and instructed subjects not to disclose details of their therapist or treatment"
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	Quote: "to maintain a single blind for psychotherapy, the clinical evaluator saw subjects in an office physically separated from the office in which therapy was conducted and instructed subjects not to disclose details of their therapist or treatment"
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	4% dropout
Selective reporting (reporting bias)	Unclear risk	Protocol not available

Carroll 2004

Study characteristics

Carroll 2004 *(Continued)*

Methods	Randomised controlled trial

Participants	**Country**: USA
	
	Participants: individuals who met DSM-IV criteria for current cocaine dependence
	
	N = 121
	
	Sex: males 74%
	
	Age: 34.6 years old (mean age)
	
	Ethnicity: white 63%, African American 31%, Latino 6%
	
	Marital status: single or divorced 77%
	
	Education level: less than high school 25%, high school graduate 40%, some education after high school 56%
	
	Employment: working full- or part-time 55%
	
	Setting: outpatient
	
	History:
	
	• Route: not reported
	• Psychostimulant use: mean monthly cocaine use at baseline was 16.6 g, and participants reported using cocaine a mean of 13.0 days in the previous 28 days
	• Other drugs: participants reported drinking alcohol a mean of 9.4 days in the previous 28 days. 54% of the participants met DSM-IV criteria for a lifetime diagnosis of alcohol dependence, and 26% met the criteria for a lifetime diagnosis of alcohol abuse. 52% of the patients met DSM-IV criteria for current alcohol abuse or dependence.
	• Psychiatric comorbidity:
	  ◦ N (%) psychiatric diagnoses meeting lifetime DSM-IV criteria: any affective disorder: 44 (36); any anxiety disorder: 23 (19); antisocial personality disorder: 48 (41); other axis II disorder: 63 (52)
	  ◦ N (%) psychiatric diagnoses meeting current DSM-IV criteria: any affective disorder: 30 (25); any anxiety disorder: 14 (12)

Interventions	The primary study had the following four arms: 1. CBT + disulphiram (n = 30) 2. IPT (interpersonal therapy) + disulphiram (n = 30) 3. CBT + placebo (n = 30) 4. IPT + placebo (n = 31) In this review, we compared the combination of groups 1 and 3 versus the combination of groups 2 and 4. **Duration of intervention**: 3 months **Duration of follow-up**: 3 months
Outcomes	• Self-reported frequency of cocaine use • Results of urine toxicology screens
Notes	**Funding source**: National Institute on Drug Abuse **Conflict of interest**: not stated No useful data for meta-analysis

Carroll 2004 *(Continued)*

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Information not reported
Allocation concealment (selection bias)	Unclear risk	Information not reported
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of personnel impossible for the types of intervention; participants blinded to the intervention
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	Incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	Information not reported
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	Information not reported, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	High risk	16% of participants dropped out before the end of treatment; balanced between groups
Selective reporting (reporting bias)	Unclear risk	Protocol not available

Carroll 2012

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: self-referred or referred by clinician on detection of positive urine tests for cocaine; methadone maintenance patients were included as participants if they met DSM-IV criteria for current cocaine dependence **N** = 112 **Age**: 38.3 years old (mean age) **Sex**: males 59% **Ethnicity**: African American 22%,Latino 14%, white 64% **Marital status**: never been married or were living alone 65% **Education level**: completed some college-level worK 34% (70% had not completed high school; 43% were high school graduates) **Employment**: unemployed 45%

Carroll 2012 *(Continued)*

	Setting: outpatients **History**: • Route: not reported • Psychostimulant use: cocaine an average of 15.4 days (SD 8.9) • Other drugs: alcohol an average of 4.6 days (SD 7.7) in the past 28 days. 100% of participants in methadone maintenance; 37% met DSM-IV criteria for a current alcohol use disorder (62% lifetime) • Psychiatric comorbidity; 35% met criteria for a lifetime diagnosis of a depressive disorder, and 17% met criteria for a lifetime anxiety disorder
Interventions	1. Disulphiram (n = 30) or placebo (n = 26) 2. 12-step facilitation (TSF) with disulphiram (n = 29) or with placebo (n = 27) **Duration of intervention**: 3 months **Duration of follow-up**: 3 months
Outcomes	Frequency of self-reported cocaine use and results of urine toxicology screens
Notes	**Funding source**: NIDA grants R01-DA10679 and P50-DA09241 **Conflict of interest**: "All authors have no conflicts to declare" On average, participants had been enroled in the methadone programme for 14.8 months (SD 50.9) at the time of the baseline assessment and their mean methadone dose was 87 mg (SD 19.0). The participants reported an average of 8 previous arrests and 20 months of incarceration during their lifetimes.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "A computerized urn randomization . . . program used in several previous multicenter trials. . . was used to balance groups with respect to baseline severity of cocaine dependence, alcohol use, gender and race."
Allocation concealment (selection bias)	Unclear risk	Information not reported
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	No information reported
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Incomplete outcome data (attrition bias)	Low risk	1.7% dropout at the end of treatment; 3% at follow-up, balanced across groups

Carroll 2012 *(Continued)*

All outcomes except retention in treatment		
Selective reporting (reporting bias)	Unclear risk	Protocol not available

Carroll 2014

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: DSM-IV criteria for current (within the past 30 days) cocaine dependence. Participants recruited from methadone maintenance programmes **N** = 101 **Age**: 42 years old (mean of mean) **Sex**: males 40% **Ethnicity**: African American 30%, white 60%, Latino 8% **Marital status**: single or divorced 88% **Education level**: completed high school 71% **Employment**: unemployed:89% **Setting**: outpatients **History**: • Route: not reported • Psychostimulant use: participants used cocaine an average of 15 days per month and had been using cocaine for approximately 11 years. • Other drugs: they reported using marijuana for about 2.5 days per month and alcohol less than 1 day per month. 100% of participants in methadone maintenance; current alcohol use disorder: 2.2% in experimental and 5.7% in the control group. • Psychiatric comorbidity: major depression, lifetime 31.9% in experimental treatment and 25.9% in the control group; anxiety disorder, lifetime: 34% in experimental treatment, 29.6% in control group
Interventions	1. Standard methadone maintenance (treatment as usual) (n = 54) 2. Treatment as usual plus CBT4CBT (computer-based training for CBT) (n = 47) **Duration of intervention**: 2 months **Duration of follow-up**: 12 months
Outcomes	**Primary outcomes**: • Change in self-reported drug use over time verified by urine analysis (days of cocaine use by week) • Results of urine toxicology screens (operationalised as the percentage of drug-negative urine samples collected during treatment) • Attainment of 3 or more weeks of continuous abstinence **Secondary outcomes**: included reductions in self-reported HIV risk behaviours

Carroll 2014 *(Continued)*

Notes	**Funding source**: National Institute on Drug Abuse grants R37-DA 015969 and P50-DA09241 **Conflict of interest**: "Dr. Carroll works with Yale University to manage any potential conflicts of interest. The other authors report no financial relationships with commercial interests."

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote "We used a computerized urn randomization program"
Allocation concealment (selection bias)	Unclear risk	Information not reported
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	No information reported
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	8% dropout, balanced across groups
Selective reporting (reporting bias)	Low risk	All the outcomes listed in the study protocol were also reported in the study.

Carroll 2016

Study characteristics

Methods	Randomized controlled trial
Participants	**Country**: USA **Participants**: meet DSM-IV diagnostic criteria for current cocaine dependence **N** = 99 **Age**: 39.3 (7.5), mean age (SD) **Sex**: females 27.3%

Carroll 2016 *(Continued)*

	Ethnicity: white 39.4%, African American 49.5%, Latino/a 7.1%, other 7.1% **Marital status**: single 71.7% **Education level**: high school education 85.9% **Employment**: unemployed 66.7% **Setting**: outpatients **History**: • Route: not reported • Psychostimulant use: cocaine dependence • Other drugs: individuals were excluded if they were currently dependent on another drug (except tobacco) or whose principal drug use was not cocaine • Psychiatric comorbidity: major depression 18.2%, anxiety 5.1%
Interventions	In the primary study, participants were divided into the following 4 groups: (1) Disulfiram (DIS) + CBT/CM n = 23; (2) DIS + CBT/no CM n = 28; (3) Placebo + CBT/no CM n = 26; (4) Placebo + CBT/CM n = 22 In the present systematic review, participants were combined into the two following groups: 1. CM group (n = 45): (DIS + CBT/CM n = 23) + (Placebo + CBT/CM n = 22) 2. No CM group (n = 54): (DIS + CBT/no CM n = 28) + (Placebo + CBT/no CM n = 26) **Duration of intervention:**12 weeks **Duration of follow-up:** 3 months
Outcomes	• Dropout • Abstinence • Frequency of drug intake
Notes	**Funding source:** Support provided by National Institute on Drug Abuse grants R01 DA019078, P50-DA09241, K12 DA00167 and K05-DA00457 **Conflict of interest**: "None of the authors have other relevant financial disclosures or conflicts of interest."

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "A computerized urn randomization program used in several previous trials (Ball et al., 2007; Carroll et al., 2004a, 2009; Stout et al., 1994) was used to produce equivalent group size and balance groups with respect to baseline level of cocaine use (more or less than 11 days per month), presence of alcohol dependence (yes/no), gender and ethnicity (ethnic minority/non-minority)"
Allocation concealment (selection bias)	Unclear risk	No information
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention
Blinding of participants and personnel (performance bias)	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding

Carroll 2016 *(Continued)*

Objective outcomes		
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	No information reported
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	ITT analysis
Selective reporting (reporting bias)	Low risk	Protocol available; all the declared outcomes reported in the final publication

Carroll 2018

Study characteristics	
Methods	Randomised factorial trial
Participants	**Country**: USA **Participants**: individuals stabilised on methadone maintenance who met DSM-IV-R criteria for current cocaine dependence **N** = 120 **Age**: 38.2 years **Sex**: females 34% **Ethnicity**: white 52% **Marital status**: not reported **Education level**: completed high school: 71.5% **Employment**: unemployed: 72.5% **Setting**: outpatients **History**: • Route: not reported • Psychostimulant use: days of cocaine use, past 28 days: 14.5 • Other drugs: marijuana, cigarettes, opiates, benzodiazepines, alcohol use disorder 55% • Psychiatric comorbidity: major depression 8.75%, anxiety 13.5%, antisocial personality disorder 13.5%
Interventions	All participants received standard methadone treatment, consisting of daily methadone and weekly individual or group counselling, with access to other program services (treatment as usual, TAU) "Participants assigned to galantamine (GAL) were prescribed a maximum dose of 8 mg galantamine extended release (ER) and control group received placebo (PLA). Computer based training in CBT (CBT4CBT) was a direct-to-patient computer based version of a CBT manual that makes extensive use

Carroll 2018 *(Continued)*

	of video examples to each cognitive and behavioral control skills in 7 modules, each requiring about 30–40 minutes to complete. The CBT4CBT program uses video vignettes, quizzes, and interactive exercises to model effective use of skills and strategies. The vignettes present connected scenes of engaging characters portrayed by professional actors, who first experience a common risky situation or problem and then, after the skill is taught, demonstrate using the targeted skill to successfully negotiate that situation without resorting to drug use. Participants assigned to CBT4CBT worked with the program in a private area at the clinic on a weekly basis, usually at the time they completed study assessments." In the primary study, participants were divided into the following 4 groups: Groups: (1) GAL plus TAU; (2) PLA plus TAU; (3) GAL plus CBT4CBT plus TAU; (4) PLA plus CBT4CBT+TAU In the present systematic review, participants were combined into the following 2 groups: 1. no CBT4CBT (n = 54): (GAL plus TAU n = 27) + (PLA plus TAU n = 27) 2. CBT4CBT (n = 66): (GAL plus CBT4CBT plus TAU n = 28) + (PLA plus CBT4CBT+TAU n = 38). **Duration of intervention:** 12 weeks **Duration of follow-up:** not reported
Outcomes	• Dropout • Abstinence • Frequency of drug intake
Notes	**Funding source:** the work was supported by grants P50-DA09241 from the National Institute on Drug Abuse. **Trial registration:** clinicaltrials.gov NCT0080935. **Conflict of interest**: "Dr. Carroll was a member in trust of CBT4CBT LLC, which made CBT4CBT available to qualified clinical providers and organizations on a commercial basis. Dr. Carroll worked with Yale University to manage any potential conflicts of interest. The other authors had no conflicts to disclose."

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "A masked, computerized urn randomization program used in previous trials... was used to produce equivalent group size and balance groups with respect to baseline level of cocaine use (more or less than 11 days per month), gender, ethnicity (ethnic minority/non-minority), age (over/under 40), and baseline Shipley estimated IQ score."
Allocation concealment (selection bias)	Unclear risk	No information available
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias)	Unclear risk	No information reported

Carroll 2018 *(Continued)*

Subjective outcomes		
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	Quote: "Recruitment fell short of this target (averaging 30 per condition), but high rates of data availability permitted analysis of the full intention to treat sample"
Selective reporting (reporting bias)	Low risk	All the outcomes listed in the protocol reported in the final publication

Crits-Christoph 1999 arm 1

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: cocaine dependence (DSM-IV) **N** = 487 **Age**: 33.9 years old (mean age) **Sex**: males 76.8% **Ethnicity**: white 57.9%, African American 39.8%, Latino 2.2% **Marital status**: living alone 69.6% **Employment**: unemployed 39.6% **Education level**: completed a mean of 13 years of school (SD 2.0) **Setting**: outpatients; 5 different sites **History**: • Route: 79.0% crack smoking, 18.9% intranasal, 2.1% intravenous • Psychostimulant use: 10.4 (SD 7.8) days of use in previous 30 days; years of use: 6.9 (SD 4.8) • Other drugs: 33% alcohol dependence, 4.5% cannabis dependence, 17.0% cannabis abuse • Psychiatric comorbidity: 28% cocaine-induced mood disorder, 4.9% cocaine-induced anxiety disorder, 14% antisocial personality disorder, and 31.8% APD as an adult with no history of a childhood conduct disorder
Interventions	In the original study, there were 4 arms: 1. CBT (CT) + group counselling (n = 119) 2. Supportive expressive (SE) therapy (psychodynamic approach) + group drug counselling (GDC) (n = 124) 3. Individual counselling (IDC) + group drug counselling (n = 121) 4. Group counselling (control) (n = 123) For this review, we did not consider group 3.

Crits-Christoph 1999 arm 1 *(Continued)*

	In Crits-Christoph 1999 arm 1, we compared group 1 (CBT (CT) + group counselling) versus group 4 (control). In Crits-Christoph 1999 arm 2, we compared group 2 (Supportive expressive (SE) therapy (psychodynamic approach) + group drug counselling (GDC) versus group 4 (control). CT, SE, and IDC: 50-minute individual sessions held twice per week during the first 3 months, then once per week for the next 3 months, and once per month during a 3-month booster phase. All 3 individual interventions also had 90-minute group drug counselling sessions held once a week for the 6-month active phase. GDC: in booster phase, participants met with group counsellor individually, 30-minute visit once a month. Group 3 (individual drug counselling + group drug counselling) was not considered in this review. **Duration of intervention**: 6 months **Duration of follow-up**: 6 months
Outcomes	• Dropouts • Use of cocaine in previous month, measured at 6 months • Use of cocaine in previous month, measured at endpoint
Notes	**Funding source**: National Institute on Drug Abuse, Rockville, MD **Conflict of interest**: not stated Drug counselling was based on the 12-step addiction and psycho-educational model, as well as providing group support and teaching problem-solving skills.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "random assignment uses a special technique known as adaptive or urn randomization"
Allocation concealment (selection bias)	Low risk	Quote: "patients were centrally randomly assigned using a computerized 'urn' randomisation procedure"
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Low risk	The ASI interviewer was blind to the treatment condition
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Incomplete outcome data (attrition bias)	Low risk	23% dropout at the end of treatment, 21% at the end of follow-up, balanced across groups

Crits-Christoph 1999 arm 1 *(Continued)*

All outcomes except retention in treatment		
Selective reporting (reporting bias)	Low risk	All the declared outcomes in the procotol were reported in the Results.

Crits-Christoph 1999 arm 2

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: cocaine dependence (DSM-IV) **N** = 487 **Age**: 33.9 years old (mean age) **Sex**: males 76.8% **Ethnicity**: white 57.9%, African American 39.8%, Latino 2.2% **Marital status**: living alone 69.6% **Employment**: unemployed 39.6% **Education level**: completed a mean of 13 years of school (SD 2.0) **Setting**: outpatients; 5 different sites **History**: • Route: 79.0% crack smoking, 18.9% intranasal, 2.1% intravenous • Psychostimulant use: 10.4 (SD 7.8) days of use in previous 30 days; years of use: 6.9 (SD 4.8) • Other drugs: 33% alcohol dependence, 4.5% cannabis dependence, 17.0% cannabis abuse • Psychiatric comorbidity: 28% cocaine-induced mood disorder, 4.9% cocaine-induced anxiety disorder, 14% antisocial personality disorder and 31.8% APD as an adult with no history of a childhood conduct disorder
Interventions	In the original study, there were 4 arms: 1. CBT (CT) + group drug counselling (n = 119) 2. Supportive expressive (SE) therapy (psychodynamic approach) + group drug counselling (GDC) (n = 124) 3. Individual drug counselling (IDC) + group drug counselling (n = 121) 4. Group drug counselling (control) (n = 123) For this review, we did not consider group 3. In Crits-Christoph 1999 arm 1, we compared group 1 (CBT (CT) + group counselling) versus group 4 (control). In Crits-Christoph 1999 arm 2, we compared group 2 (Supportive expressive (SE) therapy (psychodynamic approach) + group drug counselling (GDC) versus group 4 (control). CT, SE, and IDC: 50-minute individual sessions held twice per week during the first 3 months, then once per week for the next 3 months, and once per month during a 3-month booster phase. All 3 individual

Crits-Christoph 1999 arm 2 *(Continued)*

	interventions also had 90-minute group drug counselling sessions held once a week for the 6-month active phase. GDC: in booster phase, participants met with group counsellor individually, 30-minute visit once a month. Group 3 (individual drug counselling + group drug counselling) was not considered in this review. **Duration of intervention**: 6 months **Duration of follow-up**: 6 months
Outcomes	• Dropouts • Use of cocaine in previous month, measured at 6 months • Use of cocaine in previous month, measured at endpoint
Notes	**Funding source**: National Institute on Drug Abuse, Rockville, MD **Conflict of interest**: not stated Drug counselling was based on the 12-step addiction and psycho-educational model, as well as providing group support and teaching problem-solving skills.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "random assignment uses a special technique known as adaptive or urn randomization"
Allocation concealment (selection bias)	Low risk	Quote: "patients were centrally randomly assigned using a computerized 'urn' randomisation procedure"
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Low risk	The ASI interviewer was blind to the treatment condition
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	23% dropout at the end of treatment, 21% at the end of follow-up, balanced across groups
Selective reporting (reporting bias)	Low risk	All the declared outcomes in the procotol were reported in the Results.

Dursteler-MacFarland 2013

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: Switzerland **Participants**: cocaine dependent diacetylmorphine (DAM) maintained patients (heroin dependence according to DSM-IV) **N** = 62 **Age**: 36 years old (mean of mean) **Sex**: males 64.5% **Ethnicity**: not reported **Marital status**: unmarried 84% **Education level**: high school graduate 93.5% **Employment**: unemployed 38.7% **Setting**: outpatients **History**: • Route: not reported • Psychostimulant use: years of cocaine use in the past 30 days: about 11; 100% of participants DAM maintained • Other drugs: not reported • Psychiatric comorbidity: not reported
Interventions	1. CBGT: cognitive behavioural group therapy (n = 32) 2. TAU: treatment as usual (n = 30) Pharmacotherapy (methylphenidate or placebo) and psychotherapy **Duration of intervention**: 3 months for a total of 36 appointments **Duration of follow-up**: 3 months
Outcomes	• Retention in treatment • Cocaine-free urine screens • Self-reported cocaine use • Adverse effects
Notes	**Funding source**: Swiss Federal Office of Public Health **Conflict of interest**: "Dursteller holds a grant from the voluntary Academy Society of Basel. Petitjean, Dursteler and Wiesbeck are currently receiving a grant from Swiss National Research Foundation. The remaining authors declare no conflicts of interest."

Risk of bias		
Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	Information not reported

Dursteler-MacFarland 2013 *(Continued)*

Allocation concealment (selection bias)	Unclear risk	Information not reported
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	No information reported
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	ITT analysis
Selective reporting (reporting bias)	Unclear risk	No protocol available

Festinger 2014

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: meet DSM-IV diagnostic criteria for current cocaine dependence as assessed by the Substance Use Disorders section of the Structured Clinical Interview for DSM-IV (SCID-I) **N** = 222 **Age**: 37.20 (mean age) **Sex**: males 69% **Ethnicity**: white 58% **Marital status**: not reported **Education level**: majority of participants were high school-educated (57%) **Employment**: not paid for working in the past 30 days (98%) **Setting**: outpatients **History**: • Route: not reported

Festinger 2014 *(Continued)*

- Psychostimulant use: not reported:
- Other drugs: alcohol to intoxication (past month): CBRT, 16.44%; VBRT, 11.27%; non-CM control, 11.54%; 100% of participants in methadone maintenance
- Psychiatric comorbidity: not reported

Interventions	1. Voucher-based contingency management condition (VBRT, n = 71), + TAU 2. Cash-based contingency management condition (CBRT, n = 73), + TAU 3. Control condition (TAU, n = 78) **Duration of intervention**: 3 months **Duration of follow-up**: 3 months
Outcomes	• Abstinence • Attendance • Cocaine craving • Engagement in high-risk behaviour
Notes	We combined the results of the voucher-based contingent management and cash-based contingent management groups for comparison to the control condition. **Funding source**: National Institute on Drug Abuse R01-DA021621 **Conflict of interest**: "None of the authors represent any interests that could be interpreted as influential"

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Information not reported
Allocation concealment (selection bias)	Unclear risk	Information not reported
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	No information reported
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Unclear risk	Information on percentage of dropouts is not reported. Quote: "the cash (M = 28.49, SD = 9.05) and voucher (M = 28.28, SD = 9.78) groups to attend more research appointments than participants in the control group (M = 24.83, SD =

Festinger 2014 *(Continued)*

		10.79; ds = .37 and.33, respectively). Attendance rates for both CM groups were approximately equal (d = .02)."
Selective reporting (reporting bias)	High risk	Some outcomes described in the protocol are not reported in the results of the study.

Garcia-Fernandez 2011

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: Spain **Participants**: patients meeting DSM-IV-TR criteria for active cocaine dependence and not presenting serious psychopathological disorders or active opioid dependence **N** = 58 **Age**: 30 years old (mean age) **Sex**: males 87.9% **Ethnicity**: not reported **Marital status**: never married 48.2% **Education level**: 10 years of education (mean of mean) **Employment**: employed full-time 67.2% **Setting**: outpatients **History**: • Route: cocaine use: intranasal route 92.6 % in CRA + voucher and 93.1% in CRA • Psychostimulant use: years of regular cocaine use: 5.89 (SD 4.0) in CRA + voucher and 8.41 (SD 4.5) in CRA • Other drugs: lifetime abuse: alcohol 86.2% in CRA + voucher, 79.3% in CRA; cannabis 51.7% in CRA + voucher, 58.6% in CRA, amphetamines 24.1% in CRA + voucher, 10.3% in CRA • Psychiatric comorbidity: not reported
Interventions	1. CRA plus vouchers condition 2. CRA (Community Reinforcement Approach) **Duration of intervention**: 6 months **Duration of follow-up**: 6 months
Outcomes	• Cocaine abstinence • Treatment retention • Psychosocial functioning
Notes	**Funding source**: Spanish National Plan on Drugs (PNsD), Madrid, (Ref. MSC-06–01) and supported by a predoctoral grant from the University of Oviedo, Oviedo (Ref. UNOV-08-BECDOC). **Conflict of interest**: "The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper."

Garcia-Fernandez 2011 *(Continued)*

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "58 patients were randomly assigned to the CRA or CRA plus vouchers condition."
Allocation concealment (selection bias)	Low risk	Quote: "In accordance with a computer-generated randomization list, patients were assigned to the CRA plus vouchers group (N = 29) or to the CRA group (N = 29)."
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	No information reported
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	High risk	36.2%, balanced across groups
Selective reporting (reporting bias)	Unclear risk	Protocol not available

Garcia-Rodriguez 2007

Study characteristics

Methods	Randomised controlled trial
Participants	**Country**: Spain **Participants**: cocaine dependents according to DSM-IV (APA 2002) **N** = 96 **Age**: 29 years old (mean age) **Sex**: males 90% **Ethnicity**: not reported **Marital status**: never married 66.4% **Education level**: average years of education 10 years

Garcia-Rodriguez 2007 *(Continued)*

	Employment: employed full-time 77.5%
	
	Setting: outpatients
	
	History:
	
	• Route: intranasal: 97.3%
	• Psychostimulant use:
	  ○ Average years of consumption 6.7 years
	  ○ Weekly intake: 5 g
	• Psychiatric comorbidity: exclusion criteria for severe psychopathology (e.g. psychosis or dementia)

Interventions	1. CRA + low voucher (CM) (n = 15) 2. CRA + high voucher (CM) (n = 29) 3. Standard therapy (TAU) outpatient programme, drug-free, cognitive behavioural approach (n = 52) **Duration of intervention**: 6 months **Duration of follow-up**: 6 months
Outcomes	• Cocaine abstinence • Retention
Notes	**Funding source**: Spanish National Plan on Drugs (PNsD), Madrid, (Ref. MINT-03-01) and supported by a predoctoral grant from the Asturian Foundation for Promoting Technology and Applied Scientific Research (FICYT) (Ref. BP05-002) and a predoctoral grant from the University of Oviedo (Ref. UNIOVI-04-BECDOC-05). Authors also acknowledge the Foundation Proyecto Hombre of Asturias and Madrid **Conflict of interest**: not stated

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "randomisation according to a computer random list"
Allocation concealment (selection bias)	Unclear risk	Information not reported
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	No information reported
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding

Garcia-Rodriguez 2007 *(Continued)*

Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	ITT analyses, missing data imputed
Selective reporting (reporting bias)	Unclear risk	Protocol of the study not available

Ghitza 2007

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: heroin and cocaine users in methadone maintenance **N** = 116 **Age**: 37 years old (mean age) **Sex**: males 56% **Ethnicity**: African American 46%, white 52%, Latino 1%, and Asian 1% **Marital status**: not reported **Education level**: years of education 11.4 years (mean of mean) **Employment**: monthly income USD 453 **Setting**: outpatients **History**: • Route: not reported • Psychostimulant use: years cocaine use: 9.4 (SD 7.4); days cocaine use in the last 30 days before admission: 17.4 (SD 10.2) • Other drugs: years heroin use: 10.3 (SD 7.5); days heroin use in the last 30 days before admission: 29.0 (SD 4.3); 100% of participants in methadone maintenance. • Psychiatric comorbidity: current psychotic, bipolar, or major depressive disorders; current physical dependence on alcohol or sedatives; unstable serious medical illness were criteria for exclusion
Interventions	1. Contingent group (n = 76) 2. Non-contingent controls (n = 40) **Duration of intervention**: 3 months **Duration of follow-up**: 6 months
Outcomes	Outcome measures were qualitative urinalysis: cocaine-negative urine or opiate-negative urine during the urine-collection day after prize-drawing days
Notes	**Funding source**: Relapse prevention of the National Institutes of Health, National Institute on Drug Abuse **Conflict of interest**: not stated

Ghitza 2007 *(Continued)*

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Each participant was randomly assigned to one of three contingent conditions (manual/standard, n = 20; computerised/standard, n = 36; or computerised/high prize density, n = 20) or to a non-contingent (yoked) control group (n = 40); the disparate group sizes resulted from an error in a computerised randomisation algorithm.
Allocation concealment (selection bias)	Unclear risk	Participants were randomised to the conditions by a study technician who used a Microsoft Excel macro that stratified randomisations by ethnicity, sex, employment status, probation status, and frequency of opiate- and cocaine-positive urine specimens at baseline.
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	No information reported
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	ITT analysis
Selective reporting (reporting bias)	Unclear risk	Protocol of the study not available

Hagedorn 2013

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: veterans diagnosed with alcohol dependence only (n = 191) or stimulant dependence (cocaine, amphetamine, methamphetamine) (n = 139); only data of stimulant dependents reported **N** = **139** **Age**: 50 years old (mean age) **Sex**: males 98.59% **Ethnicity**: white 58.1%, African American 35.1%, other non-white 6.9% **Marital status**: married or cohabiting 18.8%

Hagedorn 2013 *(Continued)*

	Education level: high school diploma or less 36.15% **Employment**: unemployed 65% **Setting**: outpatients **History**: • Route: not reported • Psychostimulant use: total sample of participants using stimulants on 18.5% of days (approximately 6 days) out of the past 30 days at baseline. Participants in the stimulant dependence subgroup reported using stimulants on 40.5% of days out of the past 30 days (approximately 12 days) • Other drugs: about 60% with a diagnosis of alcohol dependence; about 10% with other substance use • Psychiatric comorbidity: within the stimulant dependence subgroup, participants in usual care were significantly more likely to have a diagnosis of depression than participants in the CM intervention (44.12% versus 28.17%; p.05). Psychiatric diagnoses: post-traumatic stress disorder (PTSD) 12.9%; other anxiety, mood, or psychotic diagnosis, 14.35%
Interventions	1. CM plus usual care: CM intervention participants received the standard programme services offered by the clinic at each site. In addition, they earned chances to win vouchers when their urine and breath test results were negative for all the targeted substances (cocaine, amphetamine, methamphetamine, and alcohol) (n = 71) 2. Usual care: standard programme services offered by the SUD clinic at each site (n = 68) **Duration of intervention**: 2 months **Duration of follow-up**: 12 months
Outcomes	• **Primary outcome**: total number of urine and breath samples out of the possible 16 samples that were negative for all targeted drugs (alcohol, cocaine, amphetamines, and methamphetamines) • **Secondary outcome**: intervention retention and longest duration of abstinence
Notes	**Funding source**:Department of Veterans Affairs, Veterans Health Administration, Office of Research & Development, Health Services Research & Development **Conflict of interest**: not stated

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "Randomization was conducted by a computer program, separately for participants within each site and drug dependence diagnosis with 90 participants planned per block. Randomization in running blocks of six ensured balanced assignment over time."
Allocation concealment (selection bias)	Unclear risk	Information not reported
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding

Hagedorn 2013 *(Continued)*

Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	No information reported
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	High risk	End of treatment: dropout CM 27.8%, usual care 25%; 6-month follow-up: CM 25.4%, usual care 29.4%; 12-month follow-up: CM 27.9%, usual care 31%.
Selective reporting (reporting bias)	Unclear risk	Protocol of the study not available

Higgins 1993

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: cocaine dependence (DSM-III-R) **N** = 38 **Age**: 29.3 years old (mean age) **Sex**: males: 89% **Ethnicity**: white: 100% **Marital status**: married 29.7% **Education level**: at least 12 years of education 60.5% **Employment**: employed 42% **Setting**: outpatient **History**: • Route: 52.5% intranasal, 29% intravenous, 16% free-base, no crack users • Psychostimulant use: 4.37 g/week • Other drugs: 55% alcohol; 42% cannabis • Psychiatric comorbidity (Addiction Severity Index): 0.35 mean (SD 0.20) (unspecified psychiatric comorbidity)
Interventions	1. CBT (CRA) + CM (n = 19) 2. Drug counselling (n = 19) (TAU) Participants who also met criteria for alcohol dependence/abuse were offered disulphiram (~250 mg/day): 42% in CBT and 5.3% in drug counselling received it. **Duration of intervention**: 6 months **Duration of follow-up**: 6 months

Higgins 1993 *(Continued)*

Outcomes	• Dropouts (12 weeks) • Dropouts (24 weeks) • Failing to attend more than 1 therapy session • Use of cocaine for at least 4 consecutive weeks • Use of cocaine for at least 8 consecutive weeks • Use of cocaine for at least 16 consecutive weeks
Notes	Community Reinforcement Approach is a multicomponent behavioural treatment, with family and friends' participation; it also provided skills training (e.g. drug refusal, problem-solving, and assertiveness), counselling for AIDS prevention, employment and new recreational activities, plus contingency management procedures. Drug abuse counselling consisted of group and individual sessions based on 12-step model of drug abuse treatment. **Funding source**: National Institute on Drug Abuse: treatment research demonstration Grant DA -06113. First independent Research and transition Award DA-04545, Research Grant DA-06526, National Research Service Award (Institutional Training Award)DA-07242, and Research Scientist Development Award DA-00109 **Conflict of interest**: not stated

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "minimum likelihood allocation was used to randomly assign patients sequentially to the two treatments."
Allocation concealment (selection bias)	Unclear risk	Information not reported
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	Information not reported
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	ITT analysis, missing urine tests counted as positives
Selective reporting (reporting bias)	High risk	Results not reported for entire treatment period

Higgins 1994

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: cocaine dependence (DSM-III-R) **N** = 40 **Age**: 31.35 years old (mean age) **Sex**: males 67.5% **Ethnicity**: white 85% **Marital status**: married 60% **Education level**: at least 12 years of education 77.5% **Employment**: employed 45% **Setting**: outpatients. • Route: 50% intranasal, 25% intravenous, 25% freebase • Psychostimulant use: median 2.55 (IQR 1.5 to 5.2) g/week • Other drugs: alcohol dependence 45% in the voucher group (VG) and 65% in the non-voucher group (NVG); marijuana 10% in the VG and 15% in the NVG; alcohol and marijuana 10% in the VG and 5% in the NVG. Opioid-dependent participants were excluded from study. • Psychiatric comorbidity: 0.35 (SD 0.25) in the VG and 0.38 (SD 0.25) in the NVG (pathology not specified)
Interventions	1. CBT (CRA) + CM (n = 20) 2. CBT (CRA) (n = 20) Participants who also met criteria for alcohol dependence/abuse (41%) were offered disulphiram (~ 250 mg/day) **Duration of intervention**: 3 months **Duration of follow-up**: 6 months
Outcomes	• Dropouts (12 weeks) • Dropouts (24 weeks) • Average duration of weeks in treatment • Use of cocaine for at least 5 consecutive weeks • Use of cocaine for at least 10 consecutive weeks • Use of cocaine for at least 20 consecutive weeks • Average duration of continuous abstinence across the 24 weeks treatment
Notes	Community Reinforcement Approach (CRA) is a multicomponent behavioural treatment, with family and friends' participation; also provided skills training (e.g. drug refusal, problem-solving, and assertiveness), counselling for AIDS prevention, employment and new recreational activities. Participants in the contingent reinforcement group received vouchers to purchase retail items in the community for each urine specimen negative for benzoylecgonine. **Funding source**: treatments research demonstration grants DA-06113 and DA-06969, research Grant DA-08076 and National Research Service **Conflict of interest**: not stated
Risk of bias	

Higgins 1994 *(Continued)*

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Quote: "minimum likelihood allocation was used to randomly assign the patients sequentially to the two treatments."
Allocation concealment (selection bias)	Unclear risk	Information not reported
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	No information reported
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	2 participants lost at follow-up, 1 per group
Selective reporting (reporting bias)	Unclear risk	Protocol of the study not available

Higgins 2000

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: cocaine dependence (DSM-III-R) **N** = 70 **Age**: 30.4 years (mean age) **Sex**: males 73% **Ethnicity**: white 94% **Marital status**: married 18.5% **Educational level**: at least 12 years of education 23% **Employment status**: employed 57%

Higgins 2000 *(Continued)*

	Setting: outpatient
	
	History:
	
	• Route: 48.5% smoking, 37% intranasal, 14.5% intravenous
	• Psychostimulant use:
	  ○ Years of regular use: 7.4 (SD 4.3)
	  ○ Days of use in past 30 days: 13.7 (SD 8.0)
	  ○ Grams used per week: 3.3 (IQR 1.8-9.1)
	  ○ Age of first cocaine use: 19.1 (SD 4.7) years
	• Other drug dependence: 57% alcohol, 23% marijuana, 17% both
	• Psychiatric comorbidity: 0.35 in voucher group; 0.38 in non-voucher group (illness psychiatric type not specified)

Interventions	1. CBT (CRA) + CM (n = 36) 2. CBT (CRA) (n = 34) **Duration of intervention**: 6 months **Duration of follow-up**: 12 months of post-treatment follow-up
Outcomes	• Dropouts (12 and 24 weeks) • Use of cocaine • Use of marijuana
Notes	Community Reinforcement Approach (CRA) is a multicomponent behavioural treatment, with family and friends' participation; also provided skills training (e.g. drug refusal, problem-solving, and assertiveness), counselling for AIDS prevention, employment and new recreational activities. Both interventions had incentives, contingent or non-contingent on urinalysis negative results. **Funding source**: National Institute of Drug Abuse **Conflict of interest**: not stated

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote on minimum likelihood allocation: "the aim of this type of randomization was to achieve balance between the treatment groups for the following baseline characteristics: gender, age. . ."
Allocation concealment (selection bias)	Unclear risk	Information not reported
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	No information reported

Higgins 2000 *(Continued)*

Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	ITT analysis
Selective reporting (reporting bias)	Unclear risk	Protocol of the study not available

Higgins 2003

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: cocaine dependence (DSM-III-R) **N** = 100 **Age**: 34 years old (mean age) **Sex**: males 59% **Ethnicity**: white 95% **Marital status**: married 20% **Employment**: full-time employment 63% **Setting**: outpatient **History**: • Route: 59% smoking, 34% intranasal, 7% intravenous • Psychostimulant use: 4 g used per week: ~3.4 (IQR 1.2-7.0) • Other drug dependence: 61% alcohol, 21% marijuana • Psychiatric comorbidity (Addiction Severity Index): 0.30 in CRA + voucher and 0.41 in voucher only
Interventions	1. CBT (CRA) + CM, n = 49 2. CM, n = 51 **Duration of intervention**:6 months **Duration of follow-up**: 36 months
Outcomes	• Dropouts (12 and 24 weeks) • Use of cocaine (12 weeks) • Use of marijuana (24 weeks)
Notes	**Funding source**: research grant DA-06113 and DA 08076 and training award DA **Conflict of interest**: not stated

Higgins 2003 *(Continued)*

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "Minimum Likely Allocation was used to randomly assign patients while achieving balance between conditions for the following baseline characteristics: sex, primary route of cocaine administration, etc"
Allocation concealment (selection bias)	Unclear risk	Information not reported
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	High risk	Quote: "formal assessment performed by a trained bachelor's level research assistant who were [sic] aware of patient treatment condition"
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	High risk	Loss at follow-up (12 and 24 weeks) was 14% and 2% in the experimental group and between 27% and 8% in the control group; unbalanced
Selective reporting (reporting bias)	Unclear risk	Protocol of the study not available

Ingersoll 2011

Study characteristics

Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: adults with crack cocaine use or crack cocaine use disorder and with a less than 90% self-reported adherence to a current prescription for HAART over the preceding 14 days were eligible to participate in the study. **N** = 54 people on HAART participated in the study **Age**: 45 years old (mean age) **Sex**: more than half of this sample (32/54) was heterosexual (of n = 28 women, n = 25 men, and n = 1 transgendered individual) **Ethnicity**: African American 82% **Marital status**: not reported **Education level**: some college education: 31.5%; high school education: 37% **Employment**: unemployed 82%

Ingersoll 2011 *(Continued)*

	Setting: outpatients **History**: • Route: 100% smoking • Psychostimulant use: most were classified as crack cocaine dependent on the MINI • Other drugs: 38.5% classified with alcohol use disorders • Psychiatric comorbidity: DSM-IV Psychiatric Disorders at baseline: current major depressive disorder (MDD), n = 25 (48.1%); recurrent MDD, n = 19 (36.5%); current dysthymia, n = 11 (21.2%); current panic D/O, n = 3 (5.8%); lifetime panic D/O, n = 8 (15.4%); current agoraphobia, n = 12 (23.1%); current social phobia, n = 8 (15.4%); current OCD, n = 10 (19.2%); current gen. anxiety, n = 16 (30.8%); current PTSD, n = 6 (11.5%); Ideation: suicidal, n = 18 (35.3%); homicidal, n = 7 (13.5%)
Interventions	1. Motivational interviewing plus feedback and skills building (MI +) 2. Video information plus debriefing (Video +) **Duration of intervention**: 6 sessions over 2 months **Duration of follow-up**: 6 months
Outcomes	**Primary outcomes** • 14-day HAART adherence • ASI Drug Composite Scores **Secondary outcomes** • HIV log VL • Percent days using crack cocaine
Notes	**Other information**: on average, participants had been diagnosed with HIV 11.3 years ago (SD 6.5); the most recent diagnosis was 4 months before, and the most distant diagnosis was 22 years before. On average, participants took 58.27% (SD 27.5) of their prescribed HAART pills in the two weeks prior to enrolment. **Funding source**: not stated **Conflict of interest**: not stated

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Information not reported
Allocation concealment (selection bias)	Unclear risk	No information reported
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias)	Low risk	Quote: "Researchers blinded to participants' assigned conditions administered the ASI, the HIV Medication Chart and Adherence Questions and the

Ingersoll 2011 *(Continued)*

Subjective outcomes		TLFB for HAART adherence and crack cocaine use, and treatment satisfaction forms"
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	Quote: "Researchers blinded to participants' assigned conditions administered the ASI, the HIV Medication Chart and Adherence Questions and the TLFB for HAART adherence and crack cocaine use, and treatment satisfaction forms"
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	High risk	25% dropout, unbalanced across group (32% and 18%)
Selective reporting (reporting bias)	Unclear risk	Protocol of the study not available

Kirby 1998

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: cocaine dependence (DSM-III-R) **N** = 90 **Sex**: males 67% **Age**: 31.7 years old (mean age) **Ethnicity**: African American 92%, white 8% **Marital status**: not reported **Education level**: not reported **Employment**: employed 11% **Setting**: outpatients **History**: • Route: 88% crack smokers, 7% intranasal, 5% intravenous • Psychostimulant use: cocaine dependence, 1% amphetamines • Other drugs: 90% alcohol; 48% marijuana; 10% heroin; 9% benzodiazepines • Psychiatric comorbidity: "absent of active psychosis or intellectual deficits"
Interventions	1. CM + CBT (n = 44) 2. CBT (n = 46) Both groups received 26 individualised sessions plus 10 one-hour group sessions training in interpersonal problem-solving. Vouchers were delivered on a weekly basis. **Duration of intervention**: 3 months **Duration of follow-up**: 3 months
Outcomes	• Treatment retention • Weeks of continuous cocaine abstinence
Notes	Manual-guided cognitive-behavioural treatment sessions

Kirby 1998 *(Continued)*

Funding source: Grant DA06986 from the National Institute on Drug Abuse

Conflict of interest: not stated

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "dependent adults were randomly assigned to behavioral counseling or counseling plus vouchers for cocaine-free urine sample"
Allocation concealment (selection bias)	Unclear risk	No information provided on allocation concealment
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	No information reported
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	No information reported but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	80% of participants did not complete the treatment. A worst-case analysis was performed, assuming that "if a patient failed to provide a specimen, we conservatively assumed the end of continuous abstinence."
Selective reporting (reporting bias)	Unclear risk	Protocol of the study not available

Knealing 2006

Study characteristics

Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: cocaine dependence (DSM-IV) **N** = **47** **Age**: 36.6 (mean of mean) **Sex**: males 10.6% **Ethnicity**: African American 85.1%, white 14.9% **Marital status**: married 10.6% **Education level**: completed 12 years of education 56.5% **Employment**: employed full-time (at intake) 0%

Knealing 2006 *(Continued)*

	Setting: outpatient **History**: • Route: not reported • Psychostimulant use: DSM–IV diagnosis, current dependence; cocaine TAU: 84%; TW: 95%; • Other drugs: alcohol TAU: 16%; TW: 14%; 100% of participants in methadone maintenance • Psychiatric comorbidity: individuals were excluded on the basis of responses to the ASI and the BDI if they were considered at imminent risk of suicide or had a psychiatric disorder that could disrupt workplace functioning or limit their ability to give informed consent (e.g. schizophrenia)
Interventions	1. Usual care + abstinent-contingent access to therapeutic workplace (CM) (n = 22) 2. Treatment as usual control group (n = 25) All participants were offered 9 months of case management and HIV risk counselling. **Duration of intervention**: 9 months **Duration of follow-up**: 15 months
Outcomes	Use of cocaine assessed by urine analysis
Notes	**Funding source**: National Institute on Drug Abuse Grant R01 DA13107 **Conflict of interest**: not stated

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Method for random sequence generation not reported. For stratification, each participant was given a binary score (0 or 1) for each of 2 stratification variables: opiate positive at intake (yes 1, no 0) and alcohol dependent (yes 1, no 0; using DSM–IV checklist criteria). Quote: "By combining the 2 scores, we assigned each participant a 2-digit binary code. Participants were randomly assigned to one of the two study groups unless there was an imbalance in the number of participants with a particular 2-digit code across the groups. If a group had more participants with that 2-digit code than the other group, the next participant with that code was assigned to the other group."
Allocation concealment (selection bias)	Unclear risk	Information not reported
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	No information reported
Blinding of outcome assessment (detection bias)	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding

Knealing 2006 *(Continued)*
Objective outcomes

Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Unclear risk	Information not reported for the total sample. Quote: "Four participants (S1, S2, S3, and S4) did not return to the Therapeutic Workplace following 'the sample left at intake.'"
Selective reporting (reporting bias)	Unclear risk	Protocol of the study not available

Landovitz 2015

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: stimulant-using methamphetamine, amphetamine, and/or powder or crack cocaine; men who have sex with men (MSM) and are at high risk of human immunodeficiency virus (HIV) acquisition **N** = 140 **Age**: 36.8 mean age (SD 10.2) **Sex**: males 10.6% **Ethnicity**: white 37%, African American 37%, Latino 18% **Sexual orientation**: gay, n = 65 (46.4%); bisexual, n = 70 (50.0%); heterosexual, n = 2 (1.4%); other, n = 3 (2.1%) **Education level**: 63% had high school education or less **Employment**: not reported; 92% reported an annual income ≤ USD 30 000 **Setting**: outpatients **History**: • Route: not reported • Psychostimulant use: not reported • Other drugs: not reported • Psychiatric comorbidity: not reported
Interventions	1. Contingency management 2. Non-contingent yoked condition **Duration of intervention**: 2 months **Duration of follow-up**: 6 months
Outcomes	• Adherence and completion • Stimulant use
Notes	**Funding source**: Financial support. "This study was supported by the California HIV Research Program, grant number MC08-LA-710. RJL acknowledges additional support from the National Institute of Drug Abuse at the National Institutes of Health (grant K23DA026308), and RJL, SS, and CJR acknowledge additional support from the National Institute of Mental Health at the National Institutes of Health (grant 5P30AI028697)." **Conflict of interest**: "All authors have submitted the ICMJE form for disclosure of potential conflicts of interest. Conflicts that the editors consider relevant to the content of the manuscript have been disclosed."

Landovitz 2015 *(Continued)*

No useful data for inclusion in meta-analysis

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Information not reported
Allocation concealment (selection bias)	Unclear risk	Information not reported
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Low risk	Quote: "Participants were assessed before treatment, weekly during treatment, and at the 12-week treatment termination point by an independent clinical evaluator who was masked to treatment condition"
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	Quote: "Participants were assessed before treatment, weekly during treatment, and at the 12-week treatment termination point by an independent clinical evaluator who was masked to treatment condition"
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	High risk	30% of participants dropped out from the study; reasons not reported for the experimental group
Selective reporting (reporting bias)	Low risk	All the declared outcomes in the protocol were reported in the results of the study.

Ledgerwood 2006

Study characteristics

Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: cocaine or opioid dependence, DSM-IV **N** = 142 **Age**: 37 years old (mean age) **Sex**: males 45.7% **Ethnicity**: white 27.1%; African American 60%, Latino 12.9% **Marital status**: information not reported

Ledgerwood 2006 *(Continued)*

	Education level: information not reported **Employment**: employed 15.5% **Setting**: outpatients **History**: • Route: not reported • Psychostimulant use: 7.7% positive urine at baseline • Other drugs: 50% alcohol abuse; 33% opioids abuse • Psychiatric comorbidity: not reported
Interventions	1. TAU, n = 38 2. TAU + CM, n = 104 **Duration of intervention**: 3 months **Duration of follow-up**: 12 months
Outcomes	• 8 weeks of continuous abstinence • University of Rhode Island Change Assessment (URICA) • Addiction severity index (ASI)
Notes	**Funding source**: "National Institutes of Health Grants R01-DA013444, R01-DA013444-suppl, R01-DA016855, R01-DA014618, P50-DA09241, P50-AA03510, and General Clinical Research Center Grant M01-RR06192". **Conflict of interest**: not stated

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "Patients were randomised to one of three treatment conditions (standard treatment, voucher CM or prize CM) using an urn randomisation procedure"
Allocation concealment (selection bias)	Unclear risk	Information not reported
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding not possible for this type of trial
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	Not likely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	Information not reported
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	Information not reported but outcomes not likely to be influenced by lack of blinding

Ledgerwood 2006 *(Continued)*

Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Unclear risk	19% dropouts, not known if balanced between groups
Selective reporting (reporting bias)	Unclear risk	Protocol of the study not available

Marsden 2006

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: UK **Participants**: psychostimulant abusers (ecstasy, cocaine powder, crack cocaine) **N** = 342 **Age**: 18.4 years old (mean age) **Sex**: males 66.3 % **Ethnicity**: white 75.9%, black 11.3%, Asian 8.6%, other 4.2% **Marital status**: information not reported **Education level**: full-time students 35% **Employment**: in full-time employment 11.1% **Setting**: outpatients **History**: • Route: information not reported • Psychostimulant use: mean 77.7% used 2.2 tablets of ecstasy for 18 days in previous 90 days; mean 61.9% used 0.5 g of cocaine powder for 9.5 days in previous 90 days; mean 33.3% used 0.25 g of crack cocaine for 10.6 days in previous 90 days • Other drugs: 89.7% cannabis abuse, 83% alcohol abuse • Psychiatric comorbidity: information not reported
Interventions	1. Brief motivational interviewing + written health risk information (n = 166) 2. Written health risk information (n = 176) **Duration of intervention**: single session of motivational intervention **Duration of follow-up**: 6 months
Outcomes	• Self-reported use of substance in the previous 90 days • Dropouts • Oral mucosal transudate toxicology on a random sample of 45 participants in each arm (30% of the sample followed-up)
Notes	**Funding source**: Department of Health for England and Wales (No 1217195). **Conflict of interest**: not stated
Risk of bias	

Marsden 2006 *(Continued)*

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "allocation of participants to the experimental and control condition was controlled and balanced by random permuted blocks"
Allocation concealment (selection bias)	Low risk	Quote: "The randomisation and concealment procedure was overseen by the trial's statistician"
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding not possible for this type of trial
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	Quote: "To guard against bias, all follow-up interviews were conducted by a different worker from the one who had administered the participant's recruitment protocol". Not specified whether assessor was blinded to treatment condition
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	Not likely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	12.5% dropout at 6-month follow-up. Balanced between treatment arms (13% brief MI; 12% written health risk information). ITT analysis; baseline scores were substituted for cases lost to follow-up.
Selective reporting (reporting bias)	Unclear risk	Protocol of the study not available

Marsden 2018

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: UK **Participants**: meet DSM-5 diagnostic criteria for moderate-to-severe cocaine use disorder (CUD) using the Structured Clinical Interview for DSM5 **N** = 30 **Age**: 44.1 (6.6) years **Sex**: males (66.7%) **Ethnicity**: White British/White Other 19/30; Black British/Black Other/Mixed11/30 **Marital status**: not reported **Education level**: not reported

Marsden 2018 *(Continued)*

Employment: (e.g. full-time, part-time, unemployed) not reported

Setting: outpatients

History:

- Route: crack cocaine, smocking, injecting and powder cocaine
- Psychostimulant use: cocaine had been regularly used for a median of 96 months (IQR 60.0–123.0); current (any) use of cocaine in past 28 days (verified by clinical record)
- Other drugs: current non-abstinent alcohol use disorder was an exclusion criterion. 20 of 30 participants had concurrent OUD and all of this group were stabilised on oral opioid agonist therapy.
- Psychiatric comorbidity co-occurring CUD and PTSD was an exclusion criterion; Prescribed anti-depressant medication 9/30; Prescribed anxiolytic/sedative medication 3/30

Interventions	1. MFCT group (n = 16) 2. TAU group (n = 14) The study evaluated the efficacy of an adjunctive psychosocial intervention for CUD, called 'memory-focused cognitive therapy' (MFCT) versus general counselling (treatment as usual; TAU). Participants were individually randomised (1:1) to a control group (ongoing TAU; 3 × 90-minute CUD cognitive conceptualisation assessments; 2 × 30-minute cocaine-related cue-induction procedures; and 3 × 30-minute research follow-ups); or to an intervention group (ongoing TAU; 3 × 90-minute cognitive conceptualisation assessments; 2 × 30-minute cocaine-related cue-induction procedures; 5 × 120-minute, one-to-one) MFCT sessions [in 1 week]; and 3 × 60-minute research follow-ups and MFCT-relapse prevention). **Duration of intervention:** 15 weeks **Duration of follow-up:** 3 months
Outcomes	• Dropout • Abstinence • Frequency of drug intake a 'timeline follow-back' structured interview to record each day of cocaine use in past 28 days), and the frequency version of the Craving Experiences Questionnaire (CEQ-F) (recall period, past two weeks; item response: 'not at all' to 'constantly' [0 to 10]; item scores summed as a total score [percentage] for tabulation.
Notes	**Funding source:** "This paper represents independent research funded by the National Institute for Health Research (NIHR) Biomedical Research Centre at South London and Maudsley NHS Foundation Trust and King's College London. South London and Maudsley NHS Trust and King's College London were the joint sponsors. They had no role in study design, data collection, analysis, interpretation, or report writing. The views expressed are those of the authors and not necessarily those of the NHS, the NIHR or the Department of Health. The corresponding author (J.M.) had full access to all study data and took the decision to submit for publication." **Trial registration:** The study is registered with the International Standard Randomised Controlled Trial registry (ISRCTN164627831). **Conflict of interest**: "The authors declare that they have no financial investment or relationship with any organisation that could inappropriately influence or benefit this research. J.M. declares investigator-led, educational grant funding from Indivior (administered by Action-on-Addiction) for a study of personalised psychosocial intervention for non-response to opioid agonist treatment (ARC Trial), and support from NIHR (HTA) for a trial of extended-release naltrexone. He acknowledges part-time employment as Senior Academic Advisor for the Alcohol, Drugs and Tobacco Division, Health Improvement, Public Health England and consultancy for the US National Institute on Drug Abuse, Centre for Clinical Trials Network. In the past 3 years, he received honoraria from Merck Serono (2015; clinical oncology training); Martindale (2017; expert meeting on OUD); and Indivior (via PCM Scientific) as co-chair (2015, 2016) and chair (2017) for the conference on Improving Outcomes in Treatment of Opioid Dependence. L.M. declares grant funding for an investigator-led, educational grant from Indivior (administered by Action- on-Addiction) for the ARC Trial. He holds no stocks in any company. C.G. is supported by a PhD studentship award from the National Institute for Health Research (NIHR) Biomed-

Marsden 2018 *(Continued)*

ical Research Centre at South London and Maudsley NHS Foundation Trust and King's College London. J.S. is a researcher and clinician who has worked with a range of types of treatment and rehabilitation service-providers. He is supported by the NIHR BRC for Mental Health at S La Mand KCL. He has also worked with a range of governmental and non-governmental organisations, and with pharmaceutical companies to seek to identify new or improved treatments from whom he and his employer (KCL) have received honoraria, travel costs and/or consultancy payments. This includes work with, during past 3 years, Martindale, Reckitt-Benckiser/Indivior, MundiPharma, Braeburn/Camrus (none of these activities relate to the study being reported here). N.G. is part supported by a research grant from theWellcome Foundation (grant held by Professors Anke Ehlers and David Clark at the University of Oxford). All other authors declare no competing interests."

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "web-accessed, computer-generated random sequence (with random varying blocks, and no stratification factors) independently managed by the King's College London Clinical Trials Unit"
Allocation concealment (selection bias)	High risk	Quote: "It was not feasible to mask group allocation. The participant was immediately informed of their allocation."
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding not possible for this type of trial
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	No information
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	Not likely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	No dropout from the study
Selective reporting (reporting bias)	Unclear risk	No protocol available

Maude-Griffin 1998

Study characteristics

Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: cocaine dependence (DSM-III-R)

Maude-Griffin 1998 *(Continued)*

N = 128
Sex: males 98.4%
Age: information not reported
Ethnicity: African American 80%
Marital status: married 14%

Education level: not reported

Employment: employed 16%

Setting: outpatients

History:

- Route: 100% crack smokers
- Psychostimulant use: years of use: mean 19 years; days of use: 14 days in the last month; money spent: mean USD 110 a day on cocaine
- Other drugs: not reported
- Psychiatric comorbidity: excluded patients with diagnosis of schizophrenia; 82% of the participants had at least 1 of the 3 psychiatric disorders assessed at baseline: major depressive disorder, post-traumatic stress disorder or antisocial personality disorder

Interventions	1. CBT (CT) (n = 59) 2. 12-step approach (n = 69) In each treatment condition, participants attended 3 group therapy sessions and 1 individual counselling session each week for 12 weeks. Group therapy sessions were considered to be the primary intervention, individual sessions being adjunctive. **Duration of intervention**: 3 months **Duration of follow-up**: 6 months
Outcomes	• 4 consecutive weeks of abstinence from cocaine • Point prevalence abstinence of cocaine by treatment condition
Notes	**Funding source**: Department of Veterans Affairs health service research and development merit review grants and National Institute of Drug Abuse **Conflict of interest**: not stated

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 provided on allocation concealment
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention
Blinding of participants and personnel (performance bias)	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding

Maude-Griffin 1998 *(Continued)*

Objective outcomes		
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	No information reported
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Unclear risk	92% completed the 12-week assessment; 84% completed the 24-week follow-up assessment. Information on percentage of dropout for each group not reported, but authors stated that there was no significant difference
Selective reporting (reporting bias)	Unclear risk	Protocol of the study not available

McDonell 2013

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: cocaine, amphetamine or methamphetamine dependence (MINI) and schizophrenia, schizoaffective disorder, bipolar disorder, or recurrent major depressive disorder **N** = 176 **Age**: 42.7 years old (mean age) **Sex**: males 34.6% **Ethnicity**: white 53.9%; African American 30.1%; others 16% **Marital status**: information not reported **Education level**: information not reported **Employment**: information not reported **Setting**: outpatients **History**: • Route: information not reported • Psychostimulant use: mean 6 days use of cocaine and 0.7 days use of amphetamines in the 30 days prior to study entry; 95% cocaine, 38.6% amphetamines abuse or dependence • Other drugs: 45.4% alcohol abuse or dependence; 63% non-stimulant drug abuse or dependence • Psychiatric comorbidity: 26% major depressive disorder, 34% bipolar disorder, 40% schizoaffective-spectrum disorder
Interventions	1. Standard treatment + CM (n = 91) 2. Standard treatment + non-contingent reinforcement (n = 85) **Duration of intervention**: 3 months

McDonell 2013 *(Continued)*

	Duration of follow-up: 3 months
Outcomes	• Days of stimulant use • Days of alcohol use • Injection drug use • Brief Symptom Inventory Score • Positive and Negative Symptom Scale Excitement Factor Score • Dropout • Urine toxicology
Notes	**Funding source**: "Drs Roll and McPherson have received research funding in the past 12 months from Bristol-Myers Squibb" **Conflict of interest**: "Dr Ries has been on the speaker bureaus of Lilly, Bristol-Myers Squibb, Pfizer, Janssen, Astra-Zeneca and Suboxone in the past five years. All authors have no disclosure to report"

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "Randomization was conducted using the urn-randomization procedure"
Allocation concealment (selection bias)	Unclear risk	Information not reported
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding not possible for this type of trial
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	Not likely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	Information not reported
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	Not likely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	ITT analysis. Quote: "multiple imputation procedures were used to handle missing data; multiple imputation requires the assumption of missing at random. Preliminary analysis identified 12 variables that predicted missingness due to treatment drop out. We used these variables to help ensure that our missing at random was tenable"
Selective reporting (reporting bias)	Low risk	All the declared outcomes in the protocol were reported in the results of the study.

McKee 2007

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: cocaine abuse or dependence (DSM-IV) **N** = 74 **Age**: 35 years old (mean age) **Sex**: males 73% **Ethnicity**: white 44.6%, African American 48.6%, Latino 6.7% **Marital status**: never married 52.7%, married or cohabitating 31%, divorced or separated 16.2% **Education level**: college graduate 4%, partial college 25.6%, high school graduate 32.4%, less than high school 37.8% **Employment**: full-time employment 37.8%, part-time employment 10%, unemployed 51.3% **Setting**: inpatients and outpatients **History**: • Route: not reported • Psychostimulant use: mean 7.1 days of cocaine abuse in past 30 days • Other drugs: mean 3.1 days of cannabis abuse, mean 8.7 days of alcohol abuse in past 30 days • Psychiatric comorbidity: not reported
Interventions	1. Brief CBT + motivational enhancement techniques (MET) (n = 38) 2. Brief cognitive behavioural therapy (CBT) (n = 36) **Duration of intervention**: 3 sessions within 2 months **Duration of follow-up**: 4 months
Outcomes	• Retention • Urine toxicology (cocaine, marijuana, opiates, benzodiazepines) • Thoughts about abstinence scale (TAAS) • Client satisfaction scale (CSQ) • Patient therapy session report (PTSR)
Notes	**Funding source**: not stated **Conflict of interest**: not stated

Risk of bias		
Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	Quote: "eligible individuals were randomised to therapy condition"
Allocation concealment (selection bias)	Low risk	Quote: "Therapists, participants and staff were unaware of the therapy assignment until the patient showed for session one"
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding not possible for this type of trial

McKee 2007 *(Continued)*

Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Low risk	Quote: "Assessments were collected by research staff blind to the therapy condition"
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	Not likely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	High risk	35.1% dropout. Unbalanced between treatment arms (38.8% CBT; 31.5% CBT + MET)
Selective reporting (reporting bias)	Unclear risk	Protocol of the study not available

Menza 2010

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: men who have sex with men (MSM), with methamphetamine abuse **N** = 127 **Age**: 39 years old (mean age) **Sex**: males 34.6% **Ethnicity**: white 60%, African American 8%, Native American or Alaska Native 6%, Latino 13%, others 13% **Marital status**: information not reported **Education level**: college or greater 10%, partial college training 47%, high school 24%, less than high school 15% **Employment**: employed 30% **Setting**: outpatients **History**: • Route: 54% injection of methamphetamines • Psychostimulant use: 65% weekly or daily use for prior 6 weeks: 46% inhaled nitrates, 31% erectile dysfunction medications, 28% cocaine, 42% crack, 15% ecstasy, 20% gamma-hydroxybutyrate • Psychiatric comorbidity: information not reported
Interventions	1. Standard treatment and CM (n = 70) 2. Standard treatment (n = 57)

Menza 2010 *(Continued)*

	Duration of intervention: 3 months **Duration of follow-up**: 3 months
Outcomes	• Non-concordant unprotected anal intercourse (UAI) • Number of non-concordant UAI partners • Self-reported methamphetamine use • Self-reported use of more than 2 g of methamphetamine • Retention • Urine toxicology
Notes	**Funding source**: not stated **Conflict of interest**: the authors declare that they have no competing interests

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "The study randomised participants using a block of two, four and eight varied randomly with a pseudo-random number generator"
Allocation concealment (selection bias)	Low risk	Quote: "The randomizations list was used to assemble sequentially numbered, sealed, opaque envelopes containing intervention arm assignment "
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding not possible for this type of trial
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	Not likely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	High risk	Self-reported outcomes possibly influenced by lack of blinding
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	Not likely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	19.6% dropouts, balanced between groups (20% CM, 19% TAU only)
Selective reporting (reporting bias)	Low risk	All the declared outcomes in the protocol were reported in the results of the study.

Miguel 2017

Study characteristics

Miguel 2017 *(Continued)*

Methods	Randomised controlled trial
Participants	**Country**: Brazil **Participants**: treatment-seeking, crack cocaine-dependent individuals with a diagnosis of crack cocaine dependence according to the DSM-IV **N** = 65 **Age** in years (SD): standard treatment alone (STA) 35.4 (8.5); standard treatment plus contingency management (STCM) 35.3 (8.7) **Males**: STA 81.3%; STCM 90% **Ethnicity**: not reported **Marital status**: not reported **Education level** (SD): STA 9.774 (3.747); STCM 8.911 (3.441) years **Employment**: STA 84.4%; STCM 84.8% **Setting**: outpatients **History**: • Route: crack cocaine • Psychostimulant use: crack cocaine. The average length of crack cocaine use was over 12 years, with an average age of onset of approximately 22 years • Other drugs: those whose drug of choice was not crack cocaine were excluded; 75% had more than one substance use disorder (THC; alcohol) • Psychiatric comorbidity: those with a DSM-IV diagnosis of schizophrenia were excluded. Proportions of samples testing negative for marijuana and alcohol were an outcome measure
Interventions	1. Standard treatment plus contingency management (STCM; n = 33) 2. Standard treatment alone (STA; n = 32). Participants in the STCM group (n = 33) received the exact same treatment as those in the STA group except that they could earn vouchers (monetary incentives) for being abstinent. No form of monetary incentive was offered to the STA group participants.
Outcomes	• Longest duration of confirmed crack cocaine abstinence (LDA) • Proportion of samples testing negative for crack cocaine • Proportions of samples testing negative for marijuana and alcohol
Notes	**Funding source:** "This study was supported by grants from Fundação de Amparo a Pesquisa de Sao Paulo (FAPESP) during the design, conduct and stages of data analyses and interpretation (Regular Research award number 2011/01469-7 and Ph.D. Scholarship award number 2013/04138-7). This study was also supported by a grant from the Clinical Trials Network Pacific Northwest Node (award number 5 U10 DA013714-10) from the National Institute on Drug Abuse (NIDA)." **Trial registration:** This study was registered at ClinicalTrials.gov under the identifier number NCT01815645. **Conflict of interest:** "All authors report no real or potential conflict(s) of interest, including financial, personal, or other relationships with other organizations or pharmaceutical/biomedical companies that may inappropriately impact or influence the research and interpretation of the findings."

Risk of bias

Bias	Authors' judgement	Support for judgement

Miguel 2017 *(Continued)*

Random sequence generation (selection bias)	Low risk	Quote: "permuted block randomization; Participants were stratified by the concurrent diagnosis of alcohol dependence."
Allocation concealment (selection bias)	Unclear risk	No information
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	No information reported
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judged that the outcome is unlikely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	No dropout from study
Selective reporting (reporting bias)	High risk	Protocol available. Primary and secondary outcomes changed at the time of publication. Several original secondary outcomes (craving, anxiety, depression) not assessed

Miguel 2022

Study characteristics	
Methods	Single-blind randomised controlled trial
Participants	**Country**: Brazil **Participants**: treatment-seeking individuals who use crack **N** = 98 **Age** (SD): 38.7 (9.5) years **Sex**: 83 males (84.7%) **Ethnicity**: black 53 (54.1%), white 43 (43.9%), Asian 2 (2%) **Marital status**: single 86 (87.8%), married 5 (5.1%), divorced 7 (7.1%) **Education level**: 8.7 years of schooling (SD 2.7) **Employment**: unemployed 60 (61.2%) **Setting**: outpatients

Miguel 2022 *(Continued)*

	History: • Route: crack use • Psychostimulant use: cocaine mean age of first use of crack use was 20.6 years old (SD 6.9), with an average duration of continuous crack use of 15 years (SD 9.7) • Other drugs: multiple substance use disorders (73.5%), alcohol use disorders (87.8%) and tobacco use disorder (68.4%)
Interventions	1. Control condition (n = 48): 12 weeks of the standard treatment: public ambulatory treatment program for persons who use crack and live in the "Crackland" region in downtown São Paulo (Unidade Recomeço Helvétia - URH) 2. Experimental condition (n = 50): same treatment + contingency management (URH + CM) In URH + CM, participants were provided with vouchers with monetary value for submission of negative cocaine urinalysis twice weekly. **Duration of intervention:** 12 weeks **Duration of follow-up:** 3 months follow-up
Outcomes	**Primary outcome**: objective verification of crack cocaine abstinence during the course of treatment assessed as negative cocaine urinalysis tested twice weekly for 12 weeks. **Secondary outcomes** included "three within-treatment cocaine use outcome measures (longest duration of abstinence; percent of negative cocaine urinalysis submitted; achievement of three or more weeks of continuous abstinence) that have previously shown to predict better long-term treatment outcomes for cocaine and other stimulant use disorders treatment trials. All three cocaine use outcome measures were computed based exclusively on urine toxicological results. Finally, treatment retention, defined as the number of weeks elapsed between treatment intake and dropout (i.e., last appearance at treatment), was also analyzed as a secondary outcome."
Notes	**Funding source:** "This study was supported by the Research and Innovation grant for Prevention of Mental Disorders and Abuse of Alcohol and Other Drugs (Pesquisas e Inovações em Prevenção de Transtornos Mentais e Uso de Álcool e Outras Drogas) funded by the Brazilian Ministry of Health (TED #176/2017). Dr. Miguel was supported by Fundação de Amparo àPesquisa do Estado de São Paulo (FAPESP) with the postdoctoral fellowship processes n°2017-05371-8 and n°2017-22004-9. The Ministry of Health and FAPESP had no further role in the study design; the col- lection, analysis, and interpretation of data; the writing of the report; or the decision to submit the paper for publication." **Conflict of interest**: "McPherson and Roll have received research funding from the Bristol- Myers Squibb Foundation, Managed Health Connections, LLC, Ringful Health, LLC, and Pillsy, Inc. McPherson has also received research funding from the Orthopedic Specialty Institute and consulted for Consistent Care, LLC, and the United States Department of Justice. These funds are in no way related to the investigation reported here. Miguel, Simões, Yamauchi, Madruga, Smith, da Silva, Laranjeira, McDonell, and Mari have no financial relationships with commercial interests."

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "permuted block randomization with the inclusion of two binary covariates for stratification to balance the two groups (i.e., baseline urinalysis result and sex)."
Allocation concealment (selection bias)	Low risk	Quote: "Researchers responsible for the randomization had no contact with the participants and were responsible only for informing treatment providers of each participant's group allocation"

Miguel 2022 *(Continued)*

Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	Study stated it was single blinded ("blind researchers"). However, no further information was provided.
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	Study stated it was single blinded ("blind researchers"). However, no further information was provided. Review authors judged that the outcome was not likely to be influenced by lack of blinding.
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	ITT analysis with missing data imputation using adequate procedure
Selective reporting (reporting bias)	High risk	Protocol available. Primary and secondary outcomes changed at the time of publication. Two original secondary outcomes (anxiety, depression) not assessed

Milby 2008

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: cocaine dependence (DSM-IV), homeless **N** = 206 **Age**: 40 years old (mean age) **Sex**: males 74.5% **Ethnicity**: white 5.5%, African American 94.5% **Marital status**: information not reported **Education level**: 12 years (mean) **Employment**: employed: 7% **Setting**: outpatients **History**: • Route: not reported • Psychostimulant use: cocaine abused for a mean period of 12 years. • Other drugs: alcohol abused for a mean period of 18 years, cannabis used for a mean period of 10.6 years.

Milby 2008 *(Continued)*

	• Psychiatric comorbidity: significant psychological distress, as indicated by a score of 70 (2 SDs above the mean) on one or more Brief Symptom Inventory (BSI) scales
Interventions	1. Abstinence-contingent housing, vocational training, and work (CM) (n = 103) 2. Same intervention (CM) plus CBT day treatment (n = 103) **Duration of intervention**: 6 months **Duration of follow-up**: 18 months
Outcomes	• Housing and employment • Consecutive weeks of abstinence • Missing information on urine toxicology
Notes	**Funding source**: this research was supported by NIDA grant 3R01 DAD 11788-0451 **Conflict of interest**: not stated

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Information not reported
Allocation concealment (selection bias)	Unclear risk	Information not reported
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding not possible for the types of interventions
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	Not likely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Low risk	Quote: "interviewers who did not know participants' treatment assignment assessed housing and employment outcomes".
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	Not likely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	ITT analysis
Selective reporting (reporting bias)	Unclear risk	The primary outcome reported in the protocol has been included in the study results. However, the secondary outcomes are not clearly expressed in the study protocol.

Mimiaga 2019

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: men who have sex with men who met DSM-IV diagnostic criteria for crystal methamphetamine dependence **N** = 41 after randomization (46 enroled) **Age**: 39.8 (11.6) **Sex**: men (100%) **Ethnicity**: white 32 (78%); racial/ethnic minorities 9 (22%) **Marital status**: single 29 (70.7%) **Education level**: college degree or more 23 (56.1%) **Employment**: employed full- or part-time 18 (43.9%); unemployed/disabled 23 (56.1%) **Setting**: outpatients **History**: • Route: smoked, snorted, IDU ("slam"), and rectally inserted • Psychostimulant use: crystal methamphetamine addiction • Other drugs: "The frequency of other substances used in the prior three months in the context of sex (using a few hours prior to or during sex) was also queried, including poppers, non-prescribed erectile dysfunction drugs, marijuana, GHB [gamma-hydroxybutyric acid], crack, cocaine, downers, painkillers, ecstasy, and alcohol. A summary score was created of the number of substances used during sex in the prior three months by dichotomizing each substance used during sex at least once in prior three months (yes/no) and summing across the binary variables, with possible values ranging from 0 to 15. Number drugs used during sex, past 3 months at baseline SRR+BA [sexual risk reduction counseling + behavioural activation] = 5.7 (2.1); SRR = 6.1 (2.6)" • SRR: 3/20 at 3 months • Psychiatric comorbidity: depression symptom scores (MADRS) SRR+BA = 19.8 (9.7); SRR = 17.6 (8.9)
Interventions	1. Control condition (n = 20) participants were assigned to a control condition (two sessions of sexual risk reduction counseling (SRR)) 2. Experimental condition (n = 21): 2 sessions of SRR + 10 sessions of BA (behavioral activation, including 3 sessions of cognitive behavior therapy) with SRR (sexual risk reduction counseling), and 1 session of relapse prevention (13 sessions total) **Duration of intervention**: 3 months **Duration of follow-up**: 6 months
Outcomes	• Number of condomless anal sex acts • Reduction in crystal meth use • Retention in treatment
Notes	**Funding source:** not reported **Trial registration:** ClinicalTrials.gov number NCT03175159 **Conflict of interest**: not reported
Risk of bias	

Mimiaga 2019 *(Continued)*

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	No information
Allocation concealment (selection bias)	Unclear risk	No information
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	No information reported
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judged that the outcome is unlikely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	Few dropouts (3/21), balanced between groups post intervention. No dropouts at follow-up assessment
Selective reporting (reporting bias)	Unclear risk	No protocol available

Mitcheson 2007

Study characteristics	
Methods	Cluster-randomised controlled trial
Participants	**Country**: UK **Participants**: crack cocaine abuse or dependence in a methadone maintenance population **N** = 29 **Age**: 40 years old (mean age) **Sex**: males 65.5% **Ethnicity**: not reported **Marital status**: not reported **Education level**: not reported **Employment**: employed 89.6% **Setting**: outpatients **History**:

Mitcheson 2007 *(Continued)*

- Route: not reported
- Psychostimulant use: mean 2.5 daily 'rocks'; 17% powder cocaine, 20% speedball
- Other drugs: use within previous 30 days: 72% alcohol, 60% heroin, 51% benzodiazepines, 100% in a methadone maintenance programme
- Psychiatric comorbidity: information not reported

Interventions	1. Motivational interviewing (MI) plus TAU (poster display in the reception area and the ready provision of a series of in-house-produced information leaflets describing various aspects and consequences of crack cocaine use (n = 17) 2. TAU (n = 12) **Duration of intervention**: single session **Duration of follow-up**: 3 months
Outcomes	• Amount of drug use, self reported • Maudsley Addiction Profile (MAP) • Severity of dependence scale (SDS) • Hospital Anxiety and Depression Scale
Notes	**Funding source**: not stated **Conflict of interest**: not stated

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Quote: "consenting crack-using clients of the staff member who received MI training at the outset of the study were the clusters which were randomized and who were thus eligible to receive the intervention. Consenting crack-using clients of the staff who did not receive the initial training were assigned to the control group". Methods for sequence generation not described
Allocation concealment (selection bias)	High risk	Quote: "consenting crack-using clients of the staff member who received MI training at the outset of the study were the clusters which were randomized and who were thus eligible to receive the intervention. Consenting crack-using clients of the staff who did not receive the initial training were assigned to the control group". Allocation not concealed
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding not possible for this type of trial
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No objective outcome presented in this cluster-RCT
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	Information not reported
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	No objective outcome presented in this cluster-RCT

Mitcheson 2007 *(Continued)*

Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	0% dropout at follow-up
Selective reporting (reporting bias)	Unclear risk	Protocol of the study not available

Parsons 2018

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: NYC metropolitan area, USA **Participants**: HIV-positive men with methamphetamine use **N** = 210 **Age**: 40.8 **Sex**: men **Ethnicity**: white 70 (33.3%), black 72 (34.3%), Latino 54 (25.7%), other 14 (6.7%) **Marital status**: not reported **Education level**: college graduate or more 82 (39.1%) **Employment**: working 48 (22.9%), not working 162 (77.1%) **Setting**: outpatients **History**: • Psychostimulant use: at baseline, 5.76 days (SD = 5.69) of methamphetamine use in the past 30 days
Interventions	1. Experimental condition (n = 109): 8 sessions of motivational interview (MI) + cognitive behavioural therapy (CBT) 2. Control condition (n = 107): 1 session of attention-matched education control **Duration of intervention:** 12 months **Duration of follow-up:** 3, 6, 9 and 12-month follow-up
Outcomes	Self-reported measures of methamphetamine use, HIV medication adherence, and condomless anal sex
Notes	**Funding source:** "Funding support was provided by the National Institute on Drug Abuse (R01-DA023395; Jeffrey T. Parsons, Principal Investigator). The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health. The authors acknowledge the contributions of the ACE Project Team—Kristi Gamarel, Sarit Golub, Chris Hietikko, Catherine Holder, William Kowalczyk, John Pachankis, Gregory Payton, H. Jonathon Rendina, Kevin Robin, Julia Tomassilli, and the CHEST recruitment team. We also gratefully acknowledge Shoshana Kahana for her support of the project, and Pamela Goodlow." **Trial registration:** not reported

Parsons 2018 *(Continued)*

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

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "urn randomization procedures [47], which enabled stratification on race/ethnicity, years on HIV medication, viral load, number of days that participant missed their HIV medications in the last 30 days, and number of days of methamphetamine use in the last 90 days."
Allocation concealment (selection bias)	Unclear risk	No information
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding not possible for this type of trial
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	Not likely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	Information not reported
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	Not likely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	ITT analysis
Selective reporting (reporting bias)	Unclear risk	No protocol available

Peirce 2006

Study characteristics

Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: psychostimulants (cocaine, amphetamine, and methamphetamine) dependence in methadone maintenance programme **N** = 402 **Age**: 42 years old (mean age) **Sex**: males 55.8% **Ethnicity**: African American 50.4%, white 26%, Latino 16.5%, other 7%

Peirce 2006 *(Continued)*

	Marital status: married or cohabitating 13.6%; separated, divorced or widowed 35.2%; never married 51.1% **Education level**: 11.7 years (mean) **Employment**: full-time 15.4%, part-time 16.5%, unemployed 68.1% **Setting**: outpatients **History**: • Route: not reported • Psychostimulant use: 82.4% with psychostimulant dependence • Other drugs: 17.1% alcohol dependence, 8.3% cannabis dependence, 80% opioid dependence. • Psychiatric comorbidity: not reported
Interventions	1. Usual care + CM-abstinence-incentive condition (n = 204, analysed n = 198; 6 participants excluded after randomisation due to ineligibility) 2. Usual care condition (n = 198, analysed n = 190; 8 participants excluded after randomisation due to ineligibility) **Duration of intervention**: 3 months **Duration of follow-up**: 6 months
Outcomes	• Retention • Urine toxicology • Longest duration of abstinence
Notes	**Funding source**: supported by grants U10DA13034 and K23DA015739 from the National Institute on Drug Abuse, Bethesda, MD **Conflict of interest**: not stated

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "Stratification and random assignment were conducted independently at each site and accomplished by a computer program using a dynamic balanced randomization procedure".
Allocation concealment (selection bias)	Low risk	Quote: "Research staff did not know the randomisation sequence, but were aware of individual group assignment".
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding not possible for the types of interventions
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	Not likely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	Information not reported

Peirce 2006 *(Continued)*

Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	Not likely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	High risk	34% dropout, balanced between groups (32.9 % dropouts in CM group, 35.2% in TAU)
Selective reporting (reporting bias)	Unclear risk	Protocol of the study not available

Petitjean 2014

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: Switzerland **Participants**: cocaine dependence (DSM-IV) **N** = 60 **Age**: 34.5 years old (mean age) **Sex**: males 80.1% **Ethnicity**: not reported **Marital status**: married 11.7%, unmarried 76.6%, divorced/separated 11.6% **Education level**: university: 10%, college (≥ 12 years) 13%, job training after school 47%, standard school (9 years) 29%, no school degree 1% **Employment**: employed 56% **Setting**: outpatients **History**: • Route: 60% intranasal, 25% injection, 15% smoking • Psychostimulant use: mean 8.9 years of consumption, mean 1.8 days of cocaine use in the past 7 days • Other drugs: 80.1% with another SUD, 36.4% on opioid maintenance treatment • Psychiatric comorbidity: patients with current psychotic disorders excluded; 46.3% with a comorbid axis I disorder, 23.1% with a comorbid personality disorder
Interventions	1. CBT + CM (n = 29) 2. CBT only (n = 31) **Duration of intervention**: 6 months (18 CBT individual sessions, plus twice-weekly urine samples) **Duration of follow-up**: 6 months
Outcomes	• Addiction Severity Index (ASI) • Severity of Dependence Scale (SDS) • Self-reported cocaine use (frequency and amount) • Beck Depression Inventory (BDI) • Retention • Urine toxicology
Notes	**Funding source**: not stated

Petitjean 2014 *(Continued)*

Conflict of interest: Dursteler holds a grant from the Voluntary Academic Society of Basel. The remaining authors declare no conflicts of interest.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "Patients were randomly assigned to one of the two treatment arms using computerized randomization"
Allocation concealment (selection bias)	Low risk	Quote: "The allocation sequence was provided in sealed envelopes and thus blinded to the researchers and patients"
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding not possible for this type of trial
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	Information not reported
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	Not likely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	ITT analysis; missed urine test counted as positive
Selective reporting (reporting bias)	Low risk	All the declared outcomes in the protocol were reported in the results of the study.

Petry 2005a

Study characteristics

Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: stimulant (cocaine or methamphetamine) dependence (79.3%) and abuse (5.1%), DSM-IV **N** = 415 **Age**: 35.8 years old (mean age) **Sex**: males 44.6% **Ethnicity**: white 45%, African American 31.6%, Latino 12.9% **Marital status**: married or cohabitant 23.59%, separated/divorced 32.56%, never married 43.82% **Education level**: mean 11.8 years

Petry 2005a *(Continued)*

	Employment: unemployed 65.2%, employed full-time 19.5%, employed part-time 15.3% **Setting**: outpatients in 8 community clinics **History**: • Route: not reported • Psychostimulant use: 83% stimulants • Other drugs: 42% alcohol; 21% marijuana; 9.4% opiates • Psychiatric comorbidity: not reported
Interventions	1. CM + TAU (n = 223, analysed 209; 14 participants excluded after randomisation due to ineligibility) 2. TAU (n = 222, analysed 206; 16 participants excluded after randomisation due to ineligibility) **Duration of intervention**: 3 months **Duration of follow-up**: 6 months
Outcomes	• Mean time retention in treatment • Use of the 2 primary study drugs
Notes	**Funding source**: not stated **Conflict of interest**: not stated

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "Random assignment was conducted at each site independently using a computer program and a dynamic balanced randomization procedure."
Allocation concealment (selection bias)	Low risk	Quote: "The randomization sequence was unknown to research staff, but group assignment was not masked after randomization".
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	No information reported
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	7% dropout

Petry 2005a *(Continued)*

Selective reporting (reporting bias)	Unclear risk	Protocol of the study not available

Petry 2005b

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: cocaine dependence (DSM-IV) in methadone maintenance **N** = 77 **Age**: 40 years old (mean age) **Sex**: males 27% **Ethnicity**: Latino 45%, African American 35%, white 19% **Marital status**: never been married 68% **Education level**: 10.7 years (mean) **Employment**: employed full-time 25% **Setting**: outpatients at a community clinic **History**: • Route: not reported • Psychostimulant use: years of cocaine use: ~13 • Other drugs: years of heroin use: ~16.5. 100% in methadone maintenance • Psychiatric comorbidity: exclusion criteria were severe dementia, uncontrolled psychosis, or bipolar disorder
Interventions	1. CM + standard methadone group therapy (n = 40) 2. Standard methadone group therapy (n = 37) **Duration of intervention**: 3 months **Duration of follow-up**: 6 months
Outcomes	• Dropouts • Duration of abstinence • Use of cocaine
Notes	**Funding source**: "funding for this study and preparation of this report was provided by NIH" **Conflict of interest**: not stated

Risk of bias		
Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	Quote: "minimum likelihood allocation was used to randomize patients to conditions"
Allocation concealment (selection bias)	Unclear risk	Information not reported

Petry 2005b *(Continued)*

Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	No information reported
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	8% dropout, balanced across groups
Selective reporting (reporting bias)	Unclear risk	Protocol of the study not available

Petry 2007

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: cocaine dependent patients (DSM-IV) on methadone **N** = 74 **Age**: 41.6 years old (mean age) **Sex**: males 43.2% **Ethnicity**: white 23%, African American 45%, Latino American 32% **Marital status**: married 2.7% **Education level**: 12 years (median) **Employment**: employed 14.8% **Setting**: outpatients **History**: • Route: information not reported • Psychostimulant use: mean 18.1 years of consumption, mean 5.6 days of cocaine use in the past 30 days • Other drugs: 100% on methadone maintenance; 9.4% past year alcohol dependence diagnosis • Psychiatric comorbidity: not reported
Interventions	1. Standard treatment + daily methadone doses (n = 19) 2. Standard treatment + daily methadone doses + CM prize based: participants earned the opportunity to draw a card out of an urn each time they submitted cocaine-negative specimens (n = 30)

Petry 2007 *(Continued)*

	3. Standard treatment + daily methadone doses + CM vouchers based: participants earned vouchers, exchangeable for retail goods and services, for each cocaine-negative sample that they submitted (n = 27) **Duration of intervention**: 3 months **Duration of follow-up**: 9 months
Outcomes	• Addiction Severity Index (ASI) • Weeks of consecutive abstinence • Retention • Urine toxicology (cocaine and opioid)
Notes	**Funding source**: "This research was funded by National Institutes of Health Grants R01- DA13444, RO1-DA016855, RO1-DA14618, R29-DA12056, R01- MH60417-Suppl, P50-DA09241, and P50-AA03510 and by General Clinical Research Center Grant M01-RR06192." **Conflict of interest**: not stated

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "Patients were randomly assigned to one of the three treatment conditions using computerized urn randomisation procedure"
Allocation concealment (selection bias)	Unclear risk	Information not reported
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding not possible for this type of trial
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	Information not reported
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	Not likely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	ITT analysis
Selective reporting (reporting bias)	Unclear risk	Protocol of the study not available

Petry 2012a

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: cocaine dependent patients (DSM-IV) on methadone **N** = 130 **Age**: 36.7 years old (mean age) **Sex**: males 53.4% **Ethnicity**: white 71.5%, African American 7.6%, Latino 17.6%, other 3.3% **Marital status**: currently married 17.1% **Education level**: 11.5 years (mean) **Employment**: employed full-time 52% **Setting**: outpatients **History**: • Route: not reported • Psychostimulant use: cocaine or alcohol positive at baseline: 50.7% • Other drugs: 100% on methadone maintenance (mean dose 89.1 mg), 13.8 % alcohol dependence • Psychiatric comorbidity: not reported
Interventions	1. Standard treatment (n = 59) 2. Standard treatment + CM (n = 71) **Duration of intervention**: 3 months **Duration of follow-up**: 9 months
Outcomes	• Weeks remained in study treatment • Longest duration of abstinence for alcohol and cocaine • Retention • Urine toxicology
Notes	**Funding source**: "funding for this study and preparation of this report was provided by NIH Grants" **Conflict of interest**: not stated

Risk of bias		
Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	Quote: "Patients were randomized to one of two conditions using a computerized urn program"
Allocation concealment (selection bias)	Unclear risk	Information not reported
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding not possible for this type of trial

Petry 2012a *(Continued)*

Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Low risk	No self-reported outcome was evaluated in this RCT
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	Not likely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	ITT analysis
Selective reporting (reporting bias)	Unclear risk	Protocol of the study not available

Petry 2012b

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: cocaine dependent patients (DSM-IV) **N** = 442 **Age**: 36.8 years old (mean age) **Sex**: males 44.5% **Ethnicity**: African American 34%, white 44.6%, Latino 18.4%, other 3% **Marital status**: never been married 56.1% **Education level**: 11.9 years (mean) **Employment**: 33.4% **Setting**: outpatients **History**: • Route: not reported • Psychostimulant use: 4.7 mean days of use in past 30 days • Other drugs: not reported • Psychiatric comorbidity: not reported
Interventions	Cocaine-negative participants at baseline urine sample: 1. Standard treatment (n = 108) 2. Standard treatment + CM (n = 118) 3. Standard treatment + higher magnitude (CM n = 107) Cocaine-positive participants at baseline urine sample:

Petry 2012b *(Continued)*

	1. Standard treatment (n = 34) 2. Standard treatment + CM (n = 35) 3. Standard treatment + higher magnitude (CM n = 40) **Duration of intervention**: 3 months **Duration of follow-up**: 9 months
Outcomes	• Longest duration of abstinence for cocaine • Number of sessions attended • Retention • Urine toxicology
Notes	**Funding source**: "Funding for this study and preparation of this report was provided by NIH Grants" **Conflict of interest**: not stated

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "Randomization occurred via two computerized urn randomisation programs, one for each arm, at each clinic"
Allocation concealment (selection bias)	Unclear risk	Information not reported
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding not possible for this type of trial
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Low risk	No subjective outcomes were evaluated in this RCT
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	Not likely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	ITT analysis
Selective reporting (reporting bias)	Unclear risk	Protocol of the study not available

Petry 2013

Study characteristics

Petry 2013 *(Continued)*

Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: cocaine-dependent patients (DSM-IV) with severe and persistent mental health disorder **N** = 19 **Age**: 41.7 years old (mean age) **Sex**: males 58% **Ethnicity**: white 68.4%, Latino 26.3%, other 5.3% **Marital status**: information not reported **Education level**: 11.5 years (mean) **Employment**: not reported **Setting**: outpatients **History**: • Route: information not reported • Psychostimulant use: 40% cocaine-positive at baseline urine sample • Other drugs: 36.8 % alcohol dependent, 15.8% marijuana dependent, 57.9% opioid dependent (all of whom were receiving methadone or buprenorphine/naloxone maintenance • Psychiatric comorbidity: 47.4% major recurrent depression, 36.8% bipolar disorder, 15.8% schizophrenia/ schizoaffective disorder
Interventions	1. Standard treatment + CM (n = 10) 2. Standard treatment (n = 9) **Duration of intervention**: 2 months **Duration of follow-up**: 2 months
Outcomes	• Longest duration of abstinence for cocaine • Retention • Urine toxicology
Notes	**Funding source**: not stated **Conflict of interest**: none declared

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "Patients were randomised to one of two 8-week treatments after baseline evaluation. A computer program stratified patients on opioid dependence and baseline urine sample result"
Allocation concealment (selection bias)	Unclear risk	Quote: "Patients were randomised to one of two 8-week treatments after baseline evaluation. A computer program stratified patients on opioid dependence and baseline urine sample result"
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding not possible for this type of trial

Petry 2013 *(Continued)*

Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Low risk	No self-reported outcome was evaluated in this RCT
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	Not likely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	10.5% dropout, balanced between groups (11% standard treatment, 10% standard treatment + CM)
Selective reporting (reporting bias)	High risk	Secondary outcomes, as described in the protocol, were not reported in the results.

Petry 2015

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: cocaine-dependent methadone patients **N**= 240 **Age**: 40,3 years; 40.5 years (usual care), 41.0 years (300 prize CM), 40.6 years (900 prize CM), 39.1 years (900 voucher CM) **Sex** (Male %): 50.3%; 52.6% (usual care), 43.1% (300 prize CM), 43.5% (900 prize CM), 61.9% (900 voucher CM) **Marital status** (%, n): unmarried 47.4(27), 51.7 (30), 46.8 (29), 57.1 (36) for usual care, 300 prize CM, 900 prize CM, and 900 voucher CM, respectively **Education level** (years (SD): 11.6 (1.8), 11.5 (1.6), 11.9 (2.0), 11.6 (2.3) for usual care, 300 prize CM, 900 prize CM, and 900 voucher CM, respectively **Employment**: not reported **Setting**: outpatients **History**: • Route: not reported • Psychostimulant use: cocaine • Other drugs: alcohol and heroin • Psychiatric comorbidity: not reported

Petry 2015 *(Continued)*

Interventions	1. Control condition (n = 57): usual care (UC, consisting of daily methadone doses, at least monthly individual counselling, and weekly group counselling focusing on relapse prevention, coping and life skills training, and AIDS education). 2. Experimental conditions: a. (n = 58) UC plus "standard" prize CM in which average expected prize earnings were about USD 300 b. (n = 62) UC plus high magnitude prize CM in which average expected prize earnings were about USD 900 c. (n = 63) UC plus voucher CM with an expected maximum of about USD 900 in vouchers **Duration of intervention:** 12 weeks **Duration of follow-up:** 12 months
Outcomes	Primary outcomes: longest duration of continuous cocaine and alcohol negative samples (LDA) and proportion of samples submitted negative for cocaine and alcohol
Notes	**Funding source:** "This study and preparation of this report was supported in part by NIH grants R01-DA13444, P30-DA023918, R01-DA027615, P50-DA09241, P60-AA03510, and M01-RR06192."

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "computerized program (Stout, Wirtz, Carbonari, & Del Boca, 1994) randomized participants to a study treatment, balancing groups on whether participants submitted a cocaine-negative sample during the 2-week baseline phase, a variable consistently associated with response to CM"
Allocation concealment (selection bias)	Unclear risk	No information
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding not possible for this type of trial
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	Not likely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	Information not reported
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	Not likely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	No dropout from the study
Selective reporting (reporting bias)	Unclear risk	No protocol available

Petry 2018

Study characteristics	
Methods	Sequential randomised controlled trial
Participants	**Country**: USA **Participants**: patients with cocaine use disorders **N** = 141 **Age** (years (SD)): total: 39; UC = 40.6 (9.8); CM = 37.4 (10.0) **Sex**: males % (n): total: 45; 45% UC = 45.9 (28); CM = 45.0 (36) **Ethnicity**: African American % (n): UC = 41.0 (25); CM = 23.8 (19). European American: UC = 47.5 (29); CM = 62.5 (50) **Marital status**: never married % (n): UC = 50.8 (31); CM = 58.8 (47) **Education level:** years of education (SD) : UC = 11.5 (1.7); CM = 11.8 (1.8) **Employment**: not reported **Setting**: outpatients **History**: • Route: not reported • Psychostimulant use: cocaine • Other drugs: opioids, marijuana, alcohol • Psychiatric comorbidity: not reported
Interventions	In the primary study, participants with cocaine use disorders (N = 360) were randomised into 2 groups (usual care (UC, group therapy sessions focusing on time management, life skills, motivational enhancement, relapse prevention, AIDS education, and 12-step) or usual care + contingency management (CM)) for 6 weeks. At week 6, participants (n = 308) were re-randomised into 6 different groups. We included only participants who received the same treatment in both the phases: 1. Control condition:(n = 61) usual care (UC, consisting of group therapy sessions focusing on time management, life skills, motivational enhancement, relapse prevention, AIDS education, and 12-step) for 12 weeks 2. Experimental condition (n = 80) CM + usual care for 12 weeks **Duration of intervention**: 12 weeks **Duration of follow-up**:3, 6 and 9 months
Outcomes	• Number of days participant attended groups • Proportion of scheduled days participant attended groups • Longest duration of time attended all scheduled groups • Longest consecutive period of objectively determined abstinence (LDA) • Proportion of negative samples
Notes	**Funding source:** "Funding for this study and preparation of this report was provided by the NIH, awarded to Nancy Petry, P50- DA09241, P60-AA03510, R01-AA021446. We thank the patients and clinicians for participating in this study."
Risk of bias	

Petry 2018 *(Continued)*

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "computerized program; The program (Stout, Wirtz, Carbonari, & Del Boca, 1994) balanced assignment on baseline urine and breath sample results (positive for alcohol or any drug tested vs. negative for all) and whether the patient had been in a controlled environment (e.g., jail, detoxification unit) in the prior month (yes/no)."
Allocation concealment (selection bias)	Unclear risk	No information
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding not possible for this type of trial
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	Not likely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	Information not reported
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	Not likely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Unclear risk	ITT analysis
Selective reporting (reporting bias)	Unclear risk	Protocol not available

Pirnia 2016

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: Iran **Participants**: male patients with history of cocaine use **N** = 50 **Age**: 24.6 years (18 – 31) **Sex**: 100% male **Ethnicity**: 100% Iranian **Marital status**: not reported **Education level**: higher than high school diploma (CM: 64%, control: 72%).

Pirnia 2016 *(Continued)*

	Employment: employed (52.5%) **Setting**: outpatients **History**: • Route: not reported • Psychostimulant use: cocaine • Other drugs: not reported • Psychiatric comorbidity: patients with psychotic, bipolar or major depressive disorders were excluded
Interventions	1. Control condition (n = 25) 2. Experimental condition (n = 25): contingency management (CM) **Duration of intervention**: 12 weeks **Duration of follow-up:** 12 weeks
Outcomes	**Primary:** number of negative urine tests **Secondary:** cocaine usage craving index over twelve weeks
Notes	**Funding source:** not reported **Trial registration:** not reported **Conflict of interest**: no conflicts of interest declared

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	No information
Allocation concealment (selection bias)	Unclear risk	No information
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding not possible for this type of trial
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	Not likely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	Information not reported
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	Not likely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Unclear risk	No information

Pirnia 2016 *(Continued)*

Selective reporting (reporting bias)	Unclear risk	No protocol available

Poling 2006

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: cocaine abuse and opiate dependence (DSM-IV) **N** = 106 **Age**: 34.6 years old (mean age) **Sex**: males 69.8% **Ethnicity**: African American 10.4%, white 75.5%, Latino 13.2% **Marital status**: not reported **Education level**: not reported **Employment**: not reported **Setting**: outpatients **History**: • Route: not reported • Psychostimulant use: mean 16.5 days of cocaine use in past 30 • Other drugs: mean 25.5 days of heroin use in past 30 days; no information on other current drugs • Psychiatric comorbidity: 31.2% lifetime alcohol dependence; 89% lifetime cocaine dependence; 28.7% major depressive disorder in past month
Interventions	The primary study had the following four arms: 1. CBT + CM + bupropion (CMB) n = 27 2. CBT + CM + placebo (CMP) n = 25 3. CBT + voucher control + bupropion (VCB) n = 30 (non-contingent) 4. CBT + voucher control + placebo (VCP) n = 24 (non-contingent) In this review, we compared the combination of arms 1 and 2 (experimental group) versus the combination of arms 3 and 4 (control group) **Duration of intervention**: 6 months **Duration of follow-up**: 6 months
Outcomes	• Maximum consecutive weeks of opioid abstinence • Maximum consecutive weeks of cocaine abstinence • Retention • Urine toxicology (opiate and cocaine)
Notes	**Funding source**: supported by grants from the National Institute on Drug Abuse, Bethesda, MD **Conflict of interest**: not stated
Risk of bias	

Poling 2006 *(Continued)*

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "the data manager conducted the randomisation, which was computerized using an urn randomisation technique stratifying for sex, race and age"
Allocation concealment (selection bias)	Low risk	Quote: "the data manager conducted the randomisation, which was computerized using an urn randomisation technique stratifying for sex, race and age. Only the research pharmacist was aware of the medication condition. Research staff were aware of which patients were assigned to CM".
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Quote: "Only the research pharmacist was aware of the medication condition. Research staff were aware of which patients were assigned to CM". Blinding not possible for the psychological treatment
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Low risk	No subjective outcomes were evaluated in this RCT
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	Not likely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	High risk	41.4% dropout, balanced between groups (40% CMP, 44% CMB, 37% VCP, 44% VCB)
Selective reporting (reporting bias)	Unclear risk	Protocol of the study not available

Rawson 2002 arm 1

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: cocaine dependence (DSM-IV) in methadone maintenance **N** = 108 **Sex**: males 55% **Age**: 43.6 years old (mean age) **Ethnicity**: white 39%, African American 32%, Latino 26% **Marital status**: married ~24% **Education level**: ~12 years of education (mean)

Rawson 2002 arm 1 *(Continued)*

	Employment: unemployed ~36% (past 3 years) **Setting**: methadone maintenance treatment programme (MMTP) clinic **History**: • Route: 72% freebase, 20% crack, 51% intranasal, 12% intravenous • Psychostimulant use: days of use in year prior to enter study: 56.9 (SD 45.9) days; days abstinent 6 months prior to enter treatment: 12.63 (SD 20.27) days • Other drugs: 73% also with alcohol dependence or abuse; 100% in methadone maintenance • Psychiatric comorbidity: other SCID Axis 1 psychiatric disorders and antisocial personality disorder
Interventions	The primary study had the following four arms: 1. CBT + TAU (n = 28) 2. CM + TAU (n = 27) 3. CBT + CM + TAU (n = 26) 4. TAU (n = 27) In this review: • in Rawson 2002 arm 1, we compared group 1 versus group 4; • in Rawson 2002 arm 2, we compared group 2 versus group 4; • in Rawson 2002 arm 3, we compared group 3 versus group 4; • in Rawson 2002 arm 4, we compared group 1 versus group 2. **Duration of intervention**: 4 months **Duration of follow-up**: 24 months
Outcomes	Use of cocaine
Notes	**Funding source**: supported by grants from the National Institute on Drug Abuse (NIDA) Bethesda, MD **Conflict of interest**: not stated USD 40 per month incentive

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Information not reported
Allocation concealment (selection bias)	Unclear risk	Information not reported
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias)	Unclear risk	No information reported

Rawson 2002 arm 1 *(Continued)*

Subjective outcomes		
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	20% dropout, balanced between groups
Selective reporting (reporting bias)	Unclear risk	Protocol not available

Rawson 2002 arm 2

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: cocaine dependence (DSM-IV) in methadone maintenance **N** = 108 **Sex**: males 55% **Age**: 43.6 years old (mean age) **Ethnicity**: white 39%, African American 32%, Latino 26% **Marital status**: married ~24% **Education level**: ~12 years of education (mean) **Employment**: unemployed ~36% (past 3 years) **Setting**: methadone maintenance treatment programme (MMTP) clinic **History**: • Route: 72% freebase, 20% crack, 51% intranasal, 12% intravenous • Psychostimulant use: days of use in year prior to enter study: 56.9 (SD 45.9) days; days abstinent 6 months prior to enter treatment: 12.63 (SD 20.27) days • Other drugs: 73% also with alcohol dependence or abuse; 100% in methadone maintenance • Psychiatric comorbidity: other SCID Axis 1 psychiatric disorders and antisocial personality disorder
Interventions	The primary study had the following four arms: 1. CBT + TAU, (n = 28) 2. CM + TAU, (n = 27) 3. CBT + CM + TAU, (n = 26) 4. TAU, (n = 27) In this review: • in Rawson 2002 arm 1, we compared group 1 versus group 4; • in Rawson 2002 arm 2, we compared group 2 versus group 4;

Rawson 2002 arm 2 *(Continued)*

	• in Rawson 2002 arm 3, we compared group 3 versus group 4; • in Rawson 2002 arm 4, we compared group 1 versus group 2. **Duration of intervention**: 4 months **Duration of follow-up**: 24 months
Outcomes	Use of cocaine
Notes	**Funding source**: supported by grants from the National Institute on Drug Abuse (NIDA) Bethesda, MD **Conflict of interest**: not stated USD 40 per month incentive

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Information not reported
Allocation concealment (selection bias)	Unclear risk	Information not reported
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	No information reported
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	20% dropout, balanced between groups
Selective reporting (reporting bias)	Unclear risk	Protocol of the study not available

Rawson 2002 arm 3

Study characteristics

Methods	Randomised controlled trial

Rawson 2002 arm 3 *(Continued)*

Participants	**Country**: USA **Participants**: cocaine dependence (DSM-IV) in methadone maintenance **N** = 108 **Sex**: males 55% **Age**: 43.6 years old (mean age) **Ethnicity**: white 39%, African American 32%, Latino 26% **Marital status**: married ~24% **Education level**: ~12 years of education (mean) **Employment**: unemployed ~36% (past 3 years) **Setting**: methadone maintenance treatment programme (MMTP) clinic **History**: • Route: 72% freebase, 20% crack, 51% intranasal, 12% intravenous • Psychostimulant use: days of use in year prior to enter study: 56.9 (SD 45.9) days; days abstinent 6 months prior to enter treatment: 12.63 (SD 20.27) days • Other drugs: 73% also with alcohol dependence or abuse; 100% in methadone maintenance • Psychiatric comorbidity: other SCID Axis 1 psychiatric disorders and antisocial personality disorder
Interventions	The primary study had the following four arms: 1. CBT + TAU (n = 28) 2. CM + TAU (n = 27) 3. CBT + CM + TAU,(n = 26) 4. TAU (n = 27) In this review: • in Rawson 2002 arm 1, we compared group 1 versus group 4; • in Rawson 2002 arm 2, we compared group 2 versus group 4; • in Rawson 2002 arm 3, we compared group 3 versus group 4; • in Rawson 2002 arm 4, we compared group 1 versus group 2. **Duration of intervention**: 4 months **Duration of follow-up**: 24 months
Outcomes	Use of cocaine
Notes	**Funding source**: supported by grants from the National Institute on Drug Abuse (NIDA) Bethesda, MD **Conflict of interest**: not stated USD 40 per month incentive

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Information not reported

Rawson 2002 arm 3 *(Continued)*

Allocation concealment (selection bias)	Unclear risk	Information not reported
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	No information reported
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	20% dropout, balanced between groups
Selective reporting (reporting bias)	Unclear risk	Protocol of the study not available

Rawson 2002 arm 4

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: cocaine dependence (DSM-IV) in methadone maintenance **N** = 108 **Sex**: males 55% **Age**: 43.6 years old (mean age) **Ethnicity**: white 39%, African American 32%, Latino 26% **Marital status**: married ~24% **Education level**: ~12 years of education (mean) **Employment**: unemployed ~36% (past 3 years) **Setting**: methadone maintenance treatment programme (MMTP) clinic **History**: • Route: 72% freebase, 20% crack, 51% intranasal, 12% intravenous

Rawson 2002 arm 4 *(Continued)*

- Psychostimulant use: days of use in year prior to enter study: 56.9 (SD 45.9) days; days abstinent 6 months prior to enter treatment: 12.63 (SD 20.27) days
- Other drugs: 73% also with alcohol dependence or abuse; 100% in methadone maintenance
- Psychiatric comorbidity: other SCID Axis 1 psychiatric disorders and antisocial personality disorder

Interventions	The primary study had the following four arms: 1. CBT + TAU, (n = 28) 2. CM + TAU, (n = 27) 3. CBT + CM + TAU, (n = 26) 4. TAU, (n = 27) In this review: • in Rawson 2002 arm 1, we compared group 1 versus group 4; • in Rawson 2002 arm 2, we compared group 2 versus group 4; • in Rawson 2002 arm 3, we compared group 3 versus group 4; • in Rawson 2002 arm 4, we compared group 1 versus group 2. **Duration of intervention**: 4 months **Duration of follow-up**: 24 months
Outcomes	Use of cocaine
Notes	**Funding source**: supported by grants from the National Institute on Drug Abuse (NIDA) Bethesda, MD **Conflict of interest**: not stated USD 40 per month incentive

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Information not reported
Allocation concealment (selection bias)	Unclear risk	Information not reported
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	No information reported
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding

Rawson 2002 arm 4 *(Continued)*

Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	20% dropout, balanced between groups
Selective reporting (reporting bias)	Unclear risk	Protocol of the study not available

Roll 2013

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: methamphetamine dependence (DSM-IV) **N** = 118 **Age**: 32 years old (mean age) **Sex**: males 55% **Ethnicity**: African American 2.5%, white 56.7%, Latino 36.4%, Asian 2.5%, other 1.8% **Marital status**: married 14.3%,divorced 21.3%, separated 8.4%, never married/unmarried relationship 8.5% **Education level**: grades 1 to 8 - 4.2%, grades 9 to 11 - 18.6%, high school graduate - 34.7%, some college - 39.8%, graduate school - 1.7% **Employment**: employed 40.6% **Setting**: outpatients **History**: • Route: not reported • Psychostimulant use: not reported • Other drugs: not reported • Psychiatric comorbidity: not reported
Interventions	1. Standard psychosocial treatment (manualised model based on the Matrix model) (n = 29) 2. 1-month CM condition + standard treatment (n = 30) 3. 2-month CM condition + standard treatment (n = 30) 4. 4-month CM condition + standard treatment (n = 29) **Duration of intervention**: 4 months **Duration of follow-up**: 12 months
Outcomes	• Longest duration of continuous abstinence • Addiction severity index (ASI) • Retention • Urine toxicology (methamphetamine)
Notes	We combined the results of the three experimental groups and compared these to the control group. **Funding source**: not stated

Roll 2013 *(Continued)*

	Conflict of interest: authors reported "no real or potential conflict(s) of interest, including financial, personal or other relationship with other organisation or pharmaceutical/biomedical companies that may inappropriately influence or impact the research or the interpretation of the findings"

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Quote: "Participants were randomised to one of four treatment conditions"
Allocation concealment (selection bias)	High risk	Quote: "Participants were randomised to one of four treatment conditions"
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding not possible for this type of trial
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	Information not reported
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	Not likely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	ITT analysis. Missing urine tests imputed as positive
Selective reporting (reporting bias)	Unclear risk	Protocol not available

Sanchez-Hervas 2010

Study characteristics

Methods	Randomised controlled trial
Participants	**Country**: Spain **Participants**: cocaine dependence (DSM-IV) **N** = 82 **Age**: mean 31.4 years old (mean age) **Sex**: males 86.3% **Ethnicity**: not reported **Marital status**: never married 44.4% **Education level**: 9.6 years (mean)

Sanchez-Hervas 2010 *(Continued)*

	Employment: employed full-time 77.2% **Setting**: outpatients **History**: • Route: 91% intranasal • Psychostimulant use: mean 10.2 years of regular use • Other drugs: other abuses in lifetime: 52.7% alcohol, 28.1% cannabis • Psychiatric comorbidity: not reported
Interventions	1. CRA (n = 47) 2. TAU (n = 35) **Duration of intervention**: 6 months **Duration of follow-up**: 12 months
Outcomes	• Cocaine abstinence (point-prevalence and continuous) • Europe Addiction Severity Index (EuropASI) • Compliance with post-treatment assessments • Retention • Urine toxicology (cocaine)
Notes	**Funding source**: Spanish National Plan on Drugs (Ministry of Health and Consumers (ref. MSC-06-01) **Conflict of interest**: not stated

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "Computer-generated randomisation list". Randomisation process is unclear and it is not explained why more people were allocated to CRA arm
Allocation concealment (selection bias)	Unclear risk	No mention of allocation concealment information
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding not possible for this type of trial
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	Information not reported
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	Not likely to be influenced by lack of blinding
Incomplete outcome data (attrition bias)	High risk	51.2% dropout at 6 months. Unbalanced between treatment arms (44.6% CRA; 56.7% TAU)

Sanchez-Hervas 2010 *(Continued)*

All outcomes except retention in treatment		
Selective reporting (reporting bias)	Unclear risk	Protocol of the study not available

Schottenfeld 2011

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: women meeting DSM-IV criteria for cocaine dependence who were either pregnant (n = 64) or had custody of a young child (n = 81) **N** = 145 **Age**: 31.1 years old (mean age) (SD 5.7) **Sex**: males 0% **Ethnicity**: African American 78% **Marital status**: never married 81% **Education level**: high school education or its equivalent 57% **Employment**: employed full-time 3% **Setting**: outpatients **History**: • Route: cocaine use was overwhelmingly smoked (97%) • Psychostimulant use: participants reported using cocaine on average 7.6 (SD 9) days during the preceding 30 days; women assigned to TSF reported more days of use (9.4 SD 10.2) than those assigned to CRA (5.8 SD 7.3); P = 0.02) • Other drugs: 47% had a lifetime history of alcohol dependence • Psychiatric comorbidity: 24% met DSM-IV symptom criteria for current major depression based on SCID
Interventions	The primary study had the following four arms: 1. Community Reinforcement Approach (CRA) + Contingency Management (CM) (n = 36) 2. Twelve-step facilitation (TSF) + CM (n = 37) 3. CRA + non-contingent, yoked voucher control (VC) (n = 35) 4. TSF + VC (n = 37) In this review we compared the combination of arms 1 and 2 (experimental group) versus the combination of arms 3 and 4 (control group). **Duration of intervention**: 6 months **Duration of follow-up**: 12 months
Outcomes	• Treatment retention and participation • Cocaine use

Schottenfeld 2011 *(Continued)*

Notes	**Funding source**: "This work was supported by the following NIDA Projects: K24 DA000445 and R01-DA-06915. NIDA had no further role in study design; in the collection, analysis and interpretation of data; in the writing of the report; or in the decision to submit the paper for publication." **Conflict of interest**: "RS Schottenfeld, BA Moore and MV Pantalon have no conflicts of interest"

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "computerized urn randomisation procedure to balance allocation of the treatment groups on the basis of meeting symptom criteria for current major depression or lifetime alcohol dependence"
Allocation concealment (selection bias)	Unclear risk	Information not reported
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	Information not reported
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	Information not reported, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	High risk	About 50% of participants dropped out before the end of treatment; no information reported about balance between groups and reasons for dropout
Selective reporting (reporting bias)	Low risk	All the declared outcomes in the protocol were reported in the results of the study.

Secades Villa 2013

Study characteristics

Methods	Randomised controlled trial
Participants	**Country**: Spain **Participants**: cocaine dependence (DSM-IV) **N** = 118 **Age**: 31.2 years old (mean age) **Sex**: males 85.5% **Ethnicity**: information not reported

Secades Villa 2013 *(Continued)*

	Marital status: married 25.4%, divorced 20.3%, single 53.3% **Education level**: 9.8 years (mean) **Employment**: employed 65.2% **Setting**: outpatients **History**: • Route: 94% intranasal • Psychostimulant use: mean 8.4 years of regular use • Other drugs: other abuses in lifetime: 68.6% alcohol, 42.3% cannabis • Psychiatric comorbidity: not reported
Interventions	1. CRA + CM vouchers (n = 50) 2. CRA (n = 68) **Duration of intervention**: 6 months **Duration of follow-up**: 6 months
Outcomes	• Continuous cocaine abstinence • Europe Addiction Severity Index (EuropASI) • Retention • Urine toxicology (cocaine)
Notes	**Funding source:** "This project was funded by the Spanish National Plan on Drugs (PNsD) (Ref. MINT-03-01 and Ref.MSC-06-01) and supported by a grant from the University of Oviedo (Ref. UNOV-08-BECDOC)" **Conflict of interest**: not stated

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "Computer-generated randomization list"
Allocation concealment (selection bias)	Unclear risk	Information not reported
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding not possible for this type of trial
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	Information not reported
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	Not likely to be influenced by lack of blinding

Secades Villa 2013 *(Continued)*

Incomplete outcome data (attrition bias) All outcomes except retention in treatment	High risk	No clear data on dropouts
Selective reporting (reporting bias)	Unclear risk	Protocol of the study not available

Shoptaw 2005 arm 1

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: gay and bisexual with methamphetamine dependence (DSM-IV) **N** = 162 **Age**: 37 years old (mean age) **Sex**: only men (gay and bisexual) **Ethnicity**: white 80%, Mexican Latino 12%, African American 3, American Indian 1%, Asian/Pacific Islander 3% **Marital status**: not reported **Education level**: 15 years (i.e. college) **Employment**: information not reported **Setting**: outpatients **History**: • Route: not reported • Psychostimulant use: not reported • Other drugs: not reported • Psychiatric comorbidity: participants were excluded on the basis of pre-existing medical or psychiatric conditions
Interventions	The primary study had the following four arms: 1. CBT (n = 40) 2. CM (n = 42) 3. CBT + CM (n = 40) 4. Culturally tailored CBT (n = 40) In this review: • in Shoptaw 2005 arm 1, we compared group 1 versus group 2 • in Shoptaw 2005 arm 2, we compared group 3 versus group 2 • in Shoptaw 2005 arm 3, we compared group 3 versus group 1 We did not consider group 4. **Duration of intervention**: 4 months

Shoptaw 2005 arm 1 *(Continued)*

	Duration of follow-up: 12 months
Outcomes	• Methamphetamine use • Depression symptoms • Sexual risk behaviours
Notes	**Funding source**: NIDA Grants 1 R01 DA 11031 and 1 P50 DA 12755 for support **Conflict of interest**: not reported

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "[P]articipants determined to meet all study criteria were assigned to condition using an urn randomization procedure (Stout et al., 1994) that provided multivariate balance across conditions based on level of drug use (heavy versus light) and ethnicity"
Allocation concealment (selection bias)	Unclear risk	Information not reported
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	No information reported
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	ITT analysis
Selective reporting (reporting bias)	Unclear risk	Protocol of the study not available

Shoptaw 2005 arm 2

Study characteristics

Methods	Randomised controlled trial
Participants	**Country**: USA

Shoptaw 2005 arm 2 *(Continued)*

	Participants: gay and bisexual with methamphetamine dependence (DSM-IV) **N** = 162 **Age**: 37 years old (mean age) **Sex**: only men (gay and bisexual) **Ethnicity**: white 80%, Mexican Latino 12%, African American 3, American Indian 1%, Asian/Pacific Islander 3% **Marital status**: not reported **Education level**: 15 years (i.e. college) **Employment**: information not reported **Setting**: outpatients **History**: • Route: not reported • Psychostimulant use: not reported • Other drugs: not reported • Psychiatric comorbidity: participants were excluded on the basis of pre-existing medical or psychiatric conditions
Interventions	The primary study had the following four arms: 1. CBT (n = 40) 2. CM (n = 42) 3. CBT + CM (n = 40) 4. Culturally tailored CBT (n = 40) In this review: • in Shoptaw 2005 arm 1, we compared group 1 versus group 2 • in Shoptaw 2005 arm 2, we compared group 3 versus group 2 • in Shoptaw 2005 arm 3, we compared group 3 versus group 1 We did not consider group 4. **Duration of intervention**: 4 months **Duration of follow-up**: 12 months
Outcomes	• Methamphetamine use • Depression symptoms • Sexual risk behaviours
Notes	**Funding source**: NIDA Grants 1 R01 DA 11031 and 1 P50 DA 12755 for support **Conflict of interest**: not reported

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "[P]articipants determined to meet all study criteria were assigned to condition using an urn randomization procedure (Stout et al., 1994) that pro-

Shoptaw 2005 arm 2 *(Continued)*

		vided multivariate balance across conditions based on level of drug use (heavy versus light) and ethnicity"
Allocation concealment (selection bias)	Unclear risk	Information not reported
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	No information reported
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	ITT analysis
Selective reporting (reporting bias)	Unclear risk	Protocol of the study not available

Shoptaw 2005 arm 3

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: gay and bisexual with methamphetamine dependence (DSM-IV) **N** = 162 **Age**: 37 years old (mean age) **Sex**: only men (gay and bisexual) **Ethnicity**: white 80%, Mexican Latino 12%, African American 3, American Indian 1%, Asian/Pacific Islander 3% **Marital status**: not reported **Education level**: 15 years (i.e. college) **Employment**: information not reported **Setting**: outpatients

Shoptaw 2005 arm 3 *(Continued)*

	History: • Route: not reported • Psychostimulant use: not reported • Other drugs: not reported • Psychiatric comorbidity: participants were excluded on the basis of pre-existing medical or psychiatric conditions
Interventions	The primary study had the following four arms: 1. CBT (n = 40) 2. CM (n = 42) 3. CBT + CM (n = 40) 4. Culturally tailored CBT (n = 40) In this review: • in Shoptaw 2005 arm 1, we compared group 1 versus group 2 • in Shoptaw 2005 arm 2, we compared group 3 versus group 2 • in Shoptaw 2005 arm 3, we compared group 3 versus group 1 We did not consider group 4. **Duration of intervention**: 4 months **Duration of follow-up**: 12 months
Outcomes	• Methamphetamine use • Depression symptoms • Sexual risk behaviours
Notes	**Funding source**: NIDA Grants 1 R01 DA 11031 and 1 P50 DA 12755 for support **Conflict of interest**: not reported

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "[P]articipants determined to meet all study criteria were assigned to condition using an urn randomization procedure (Stout et al., 1994) that provided multivariate balance across conditions based on level of drug use (heavy versus light) and ethnicity"
Allocation concealment (selection bias)	Unclear risk	Information not reported
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias)	Unclear risk	No information reported

Shoptaw 2005 arm 3 *(Continued)*

Subjective outcomes		
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is unlikely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	ITT analysis
Selective reporting (reporting bias)	Unclear risk	Protocol of the study not available

Shoptaw 2008

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: gay or bisexual men with stimulant abuse, alcohol abuse, or both **N** = 128 **Age**: 37 years old (mean age) **Sex**: males: 100% (gay and bisexual) **Ethnicity**: Latino 21.8%, white 64.8%, others 13.2% **Marital status**: not reported **Education level**: college-educated: 69.5%, less than college 30.5% **Employment**: employed 31.2% (with an income of ≤ USD 14,999) **Setting**: outpatients **History**: • Route: 12.5% injection drug use • Psychostimulant use: cocaine abused for a mean of 11.3 days during the past 30 days; amphetamines abused for a mean of 6.5 days during the past 30 days • Other drugs: 7.8% alcohol abuse; 100% cannabis abuse • Psychiatric comorbidity: not reported
Interventions	1. Gay cognitive behavioural therapy (n = 64) 2. Gay social support therapy (n = 64) **Duration of intervention**: 12 weeks **Duration of follow-up**: 17, 26, and 52 weeks
Outcomes	• Retention rate • Days of self-reported substance use • Urine toxicology

Shoptaw 2008 *(Continued)*

	• Self-reported sexual risk behaviours
Notes	**Funding source**: "funding for this study was provided by Center for Substance Abuse Treatment Knowledge Development and Application (Grant TI-12043) to Drs Shoptaw and Reback" **Conflict of interest**: not reported

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Information not reported
Allocation concealment (selection bias)	Unclear risk	Information not reported
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding not possible for this type of trial
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	Not likely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	Information not reported
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	Not likely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	ITT analysis
Selective reporting (reporting bias)	Unclear risk	Protocol not available

Silverman 1996

Study characteristics

Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: cocaine dependence and abuse (DSM-III-R) in methadone-maintenance patients **N** = 37 **Age**: 36.05 (1.4) years old **Sex**: not reported

Silverman 1996 *(Continued)*

	Ethnicity: black 46.5%, white 53.5 **Marital status**: married 13.5% **Education level**: 2 years or more of education 67.5% **Employment**: employed 43% **Setting**: outpatient **History**: • Route: not reported • Psychostimulant use: all patients reported injecting cocaine • Other drugs: all participants reported injecting heroin; 100% of participants in methadone maintenance • Psychiatric comorbidity: 25% antisocial personality disorder
Interventions	1. CBT (CRA + CM) (n =19) 2. CBT (CRA + voucher independent to urine analysis results) (n =18) Individual sessions for both conditions. **Duration of intervention**: 3 months **Duration of follow-up**: 3 months
Outcomes	• Dropouts • Use of cocaine for at least 5 consecutive weeks
Notes	**Funding source**: National Institute on Drug Abuse, through intramural research, Baltimore, MD **Conflict of interest**: not stated

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "[P]atients were randomly assigned to the abstinence reinforcement or control group using minimum likelihood allocation. This procedure stratified patients according to whether or no they were: heavy cocaine users, light cocaine users, male, etc"
Allocation concealment (selection bias)	Unclear risk	Information not reported
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention
Blinding of participants and personnel (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 outcome assessment (detection bias) Subjective outcomes	Unclear risk	No information reported

Silverman 1996 *(Continued)*

Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is not likely to be influenced
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	ITT analysis
Selective reporting (reporting bias)	Unclear risk	Protocol of the study not available

Silverman 1998

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: cocaine abuse (DSM-III) in methadone maintenance **N** = 59 **Age**: 37.8 years old (mean age) (SD 5.2) **Sex**: males 66% **Ethnicity**: black 62.6%, white 37.4% **Marital status**: married 10.3% **Education level**: 12 years of education 66.3% **Employment**: employed 13.3% (full-time) **Setting**: outpatients **History**: • Route: 95% intravenous, 7% crack smokers • Psychostimulant use: 98% cocaine • Other drugs: 96% heroin, 61% alcohol, 28% marijuana, 100% of participants in methadone maintenance • Psychiatric comorbidity: nicotine dependence, general anxiety disorder, phobia, PTSD, manic episode, antisocial personality, bulimia, alcohol dependence, sedative dependence
Interventions	The primary study had the following three arms: 1. CM (n = 20) 2. CM + start-up bonus (n = 20) 3. Non-CM (n = 19) In this review, we compared the combination of arms 1 and 2 (experimental group) versus arm 3 (control group). **Duration of intervention**: 3 months **Duration of follow-up**: 6 months
Outcomes	• Average duration of weeks in treatment

Silverman 1998 *(Continued)*

	• Use of cocaine for at least 5 consecutive weeks
Notes	Cocaine-abusing methadone-maintenance patients. Individual sessions offered for all 3 treatment conditions. **Funding source**:National Institute on drug abuse, through intramural research fund and in part by Extramural research Grant from NIDA **Conflict of interest**: not stated

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Information not reported
Allocation concealment (selection bias)	Unclear risk	No information reported
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding of participants and personnel impossible for the types of intervention
Blinding of participants and personnel (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 outcome assessment (detection bias) Subjective outcomes	Unclear risk	No information reported
Blinding of outcome assessment (detection 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
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Unclear risk	Information on dropout is not reported
Selective reporting (reporting bias)	Unclear risk	Protocol of the study not available

Smout 2010

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: Australia **Participants**: methamphetamine use or dependence (MINI) **N** = 104

Smout 2010 *(Continued)*

	Age: 34.9 years old (mean age) **Sex**: males 60% **Ethnicity**: white 58% **Marital status**: not reported **Education level**: 11 to 13 years (mean) **Employment**: unemployed 39%, employed 39%, student 12%, other 10% **Setting**: outpatients **History**: • Route: 78% injection, 14% oral, 8% intranasal • Psychostimulant use: 6.0 g in 16 days in the last month • Other drugs: 29.8% participants positive for another, not specified, drug • Psychiatric comorbidity: not reported
Interventions	1. CBT (n = 53) 2. ACT (acceptance and commitment therapy) (n = 51) **Duration of intervention**: 3 months **Duration of follow-up**: 6 months
Outcomes	• Reported average amount of methamphetamine used in the past month • Objective methamphetamine and other drug use by hair analysis • Dropout • Severity of methamphetamine dependence (LDQ) • Beck Depression Inventory • SF-12: Short form (general mental and physical health)
Notes	**Funding source**: "This study was supported by the 2002 South Australian Premier's Drug Summit (Initiative R1.4 Young People and Amphetamines—Treatment)" **Conflict of interest**: not stated

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "computer- generated random number sequence"
Allocation concealment (selection bias)	High risk	Quote: "An allocation table was constructed by dividing the estimated sample size into an equal number of clinician-therapy combinations. These were allocated to client ID via a computer-generated random number sequence. The second author then used this table to allocate participants; although the table was not concealed from the person assigning, it was not consulted other than at the time of randomization."
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding not possible for the types of intervention

Smout 2010 *(Continued)*

Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	Not likely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Unclear risk	Information not reported
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	Not likely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	ITT analysis
Selective reporting (reporting bias)	Unclear risk	Protocol of the study not available

Sorsdahl 2021

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: South Africa **Participants**: methamphetamine use disorders **N** = 60 **Age**: 31 (6.5) **Sex**: male 32 (53.3%), female (46.7%) **Ethnicity**: black: 8.3%; "coloured" ('coloured' was a legally defined racial classification during apartheid referring to anyone not white or not of the black Bantu tribes): 88.3%; white: 3.3% **Marital status**: single (88.3%) **Education level**: finished high school (51.7%), did not finish high school (48.3%) **Employment**: unemployed (78.3%), employed (21.7%) **Setting**: outpatients **History**: • Route: not reported • Psychostimulant use: methamphetamine • Other drugs: heroin (13%) • Psychiatric comorbidity: patients with bipolar disorder, suicidality, schizophrenia (including psychosis) and antisocial personality disorder were excluded
Interventions	1. Control condition (n = 30): usual care (participants referred to a specialised, registered outpatient rehabilitation centre)

Sorsdahl 2021 *(Continued)*

	2. Experimental condition (n = 30): 6 sessions of motivational interviewing (IDMI) intervention **Duration of intervention:** the treatment group received the six-session treatment, while the control group were referred to local substance use treatment centres for treatment. Follow-up interviews were conducted at 6 weeks and 3 months following study enrolment, at which time the baseline questionnaire was re-administered. **Duration of follow-up**: 3 months
Outcomes	**Primary**:frequency of methamphetamine use (measured using the timeline followback method (TLFB) **Secondary**: Penn Alcohol Craving Scale (PACS) (modified for methamphetamine dependence), Clinical Global Impression (Severity) scale (CGI), Hamilton Rating Scale for Depression (HAM-D), Hamilton Rating Scale for Anxiety (HAM-A), Sheehan Disability Scale (SDS)
Notes	**Funding source:** "This research was funded through departmental funds" **Trial registration:** The trial is registered with the Pan African Clinical Trials Registry (Trial ID: PACTR201310000589295) **Conflict of interest**: "The authors declare that they have no competing interests."

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "The randomisation sequence was prepared by the data manager (using a computer programme) and allocation done by a trial manager."
Allocation concealment (selection bias)	Unclear risk	Quote: "allocation done by a trial manager"
Blinding of participants and personnel (performance bias) Subjective outcomes	High risk	Blinding not possible for this type of trial
Blinding of participants and personnel (performance bias) Objective outcomes	Low risk	Not likely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias) Subjective outcomes	Low risk	Quote: "a research assistant who was not involved in the recruitment of the participants and is not working at the hospital conducted the follow-up assessment and was blinded to the treatment allocation."
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	Quote: "a research assistant who was not involved in the recruitment of the participants and is not working at the hospital conducted the follow-up assessment and was blinded to the treatment allocation."
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	Quote: "The primary regression analysis used an intention-to-treat approach with last observation carried forward (LOCF) to impute scores for missing data values."
Selective reporting (reporting bias)	Unclear risk	No protocol available

Stein 2009

Study characteristics	
Methods	Randomised controlled trial
Participants	**Country**: USA **Participants**: cocaine abuse or dependence **N** = 198 **Age**: 38.1 years (mean) **Sex**: males 61.6% **Ethnicity**: white 39.8% **Marital status**: information not reported **Education level**: information not reported **Employment**: information not reported **Setting**: outpatients and inpatients **History**: • Route: 10.5% snort, 81.2% smoke, 8.6% inject • Psychostimulant use: mean 16.3 years using cocaine, mean 16.3 days used cocaine in past 30 • Other drugs: not reported • Psychiatric comorbidity: not reported
Interventions	1. 4-session motivational interviewing (MI) (n = 97) 2. Control: written handout of treatment (n = 101) **Duration of intervention**: 6 months **Duration of follow-up**: 6 months
Outcomes	• Self-reported quality of life (SF-12) • Days employed • Any entry into drug detoxification programmes, inpatient drug treatment, outpatient drug treatment, and attendance in self-help programmes • Reduction in frequency of cocaine use • Self-reported cocaine abstinence at 6 months
Notes	**Funding source**: grant from the National Institute on Drug Abuse (DA 13759) **Conflict of interest**: not stated

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)	High risk	Blinding not possible for this type of trial

Stein 2009 *(Continued)*

Subjective outcomes		
Blinding of participants and personnel (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 outcome assessment (detection bias) Subjective outcomes	Unclear risk	Information not reported
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	Not likely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes except retention in treatment	Low risk	ITT analysis
Selective reporting (reporting bias)	Unclear risk	Protocol of the study not available

ACT: acceptance and commitment therapy; **APD**: antisocial personality disorder; **ASI**: Addiction Severity Index; **BDI**: Beck Depression Inventory; **BSI**: Brief Symptom Inventory; **BT**: behaviour therapy; **CBRT**: cash-based reinforcement therapy (i.e. cash-based contingency management); **CBT**: cognitive behavioural therapy; **CM**: contingency management; **CRA**: community reinforcement approach; **CT**: cognitive therapy; **CST**: coping skills training; **ICMJE**: International Committee of Medical Journal Editors; **DAM:** diacetylmorphine; **D/O**: disorder; **DSM**: Diganostic and Statistical Manual of Mental Disorders; **IDC**: individual drug counselling; **I&R**: information and referral; **IPT**: interpersonal therapy; **IQR:** interquartile range; **ITT**: intention-to-treat; **LDQ**: Leeds Dependence Questionnaire; **MADRS:** Montgomery–Åsberg Depression Rating Scale; **MET**: motivational enhancement techniques/therapy; **MINI**: Mini-International Neuropsychiatric Interview; **MMTP**: methadone maintenance treatment programme; **MSM**: men who have sex with men; **NIDA**: National Institute on Drug Abuse; **NIH**: National Institutes of Health; **OCD**: obsessive compulsive disorder; **OTI**: Opiate Treatment Index; **PTSD**: post-traumatic stress disorder; **RBT**: reinforcement-based therapy; **RP**: relapse prevention; **SCID**: Structured Clinical Interview for DSM-IV; **SD**: standard deviation; **SDU**: standard drink units; **SE**: supportive-expressive psychotherapy; **SOAR**: service outreach and recovery; **SUD**: substance use disorder; **TAU**: treatment as usual; **TSF**: 12-Step Facilitation; **TW**: therapeutic workplace; **URICA**: University of Rhode Island Change Assessment; **VBRT**: voucher-based (reinforcement therapy (i.e. voucher-based contingency management); **VL**: viral load

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

Study	Reason for exclusion
Aharonovich 2017	Ineligible population: non-injection drug use patients: 10% heroin users, 20% "meth"; unclear if "meth" = methadone or methamphetamine
Alessi 2007	Ineligible population: not all psychostimulant users
Alim 1995	Ineligible intervention: diethylpropion treatment for craving
Azrin 1994	Ineligible population: RCT assessing the role of behaviour therapy for drug abuse; not specific to cocaine use, most were marijuana users
Azrin 1996	Ineligible population: not all psychostimulant users
Bahrami 2017	Ineligible intervention: acceptance and commitment therapy
Barrowclough 2009	Ineligible population: people with psychosis and substance misuse

Study	Reason for exclusion
Bellack 2006	Ineligible population: drug dependence (cocaine, heroin, or cannabis) and serious mental illness
Bickel 2008	Ineligible population: opioid-dependent participants
Brewer 2009	Ineligible population: alcohol or cocaine dependence: separate results for cocaine-dependent participants not provided
Brooner 1998	Ineligible population: participants were not psychostimulant users
Burduli 2018	Ineligible population: 50.9% of all participants self-reported methamphetamine as their most used drug; 36.8% self-reported cannabis as their most used drug; and 12.3% self-reported prescription opiates as their most used drug.
Campbell 2014	Ineligible population: participants self-reporting use of any illicit substance in the 30 days prior to study entry
Carrico 2018	Ineligible intervention: positive affect intervention
Chen 2013	Ineligible intervention: mindfulness plus acupuncture
Covi 2002	Ineligible comparison: compared the same intervention with two different intensities
Dansereau 1996	Ineligible population: only opioid abuse/dependence
Dees 1997	Ineligible population: heroin-addicted participants; 54% never used cocaine or any other psychostimulant
DeFulio 2009	Ineligible intervention: participants were already detoxified; intervention aimed to prevent relapse
Donovan 2013	Ineligible population: 38.9% of the sample reported stimulant abstinence in the 30 days pre-baseline
Gawin 1984	Ineligible study design: open pilot study with desipramine and lithium carbonate
Gawin 1989	Ineligible intervention: comparison of desipramine hydrochloride, lithium carbonate, and placebo treatments
Glasner 2022	Ineligible population: participants included 50% with opioid dependence, 50% with stimulant dependence
Glasner-Edwards 2007	Ineligible population: veterans with co-occurring substance-use disorders and concomitant major depressive disorder
Gonçalves 2014	Ineligible intervention: motivational interviewing combined with chess
Gottheil 1998	Ineligible comparison: compared the same intervention with two different intensities
Gross 2006	Ineligible population: opioid-dependent patients; only 25% with comorbid cocaine dependence. Results for the subgroups with comorbid participants not reported
Hall 1994	Ineligible intervention: enhanced continuity of care and desipramine
Hawkins 1989	Ineligible population: any drug abusers
Hoffman 1994	Ineligible comparison: compared the same intervention with two different intensities

Study	Reason for exclusion
Holtyn 2020	Ineligible population: opioid-dependent patients; not clear how many were also cocaine-dependent (cocaine dependence not in the inclusion criteria)
Islam 2014	Ineligible intervention: physical activity
Jones 2005	Ineligible population: not all psychostimulant abusers
Kalapatapu 2021	Ineligible intervention: counselling plus occupational therapy-based cognitive rehabilitation aimed at improving cognitive impairment in mildly to moderately cognitively-impaired participants with cocaine-use disorders
Kang 1991	Ineligible study design: stated as randomised, but the number of participants randomised to each of the three groups was not reported, and the results were provided for the whole sample together as a pre-post uncontrolled design
Kelpin 2022	Ineligible population: only 1.6% of particicpants with stimulant use
Keoleian 2013	Ineligible intervention: text messaging intervention for use as an adjunct to cognitive behavioural group therapy
Kidorf 2013	Ineligible population: opioid-dependent outpatients
Kiluk 2010	Ineligible population: substance-abusing individuals
Knight 1994	Ineligible population: methadone maintenance participants, 85% used heroin alone daily
Kouri 1995	Ineligible intervention: buprenorphine treatment in participants with concurrent opiate and cocaine abuse/dependence
Magura 1994	Ineligible comparison: compared the same intervention with two different intensities
Marcus 2009	Ineligible population: any substance dependence
Martino 2006	Ineligible population: co-occurring psychotic and drug-related disorders
Martino 2016	Ineligible population: clinical supervision for clinician providing motivational interviewing
McKay 1997	Ineligible population: already-treated participants with intensive outpatient programme (IOP); continuing aftercare intervention
McKay 1998	Ineligible population: 48 (34.8%) participants had alcohol dependence only and separate data for cocaine-dependent participants were not provided
McKay 2004	Ineligible population: already-abstinent participants in relapse prevention intervention
McKay 2005	Ineligible population: 74% of participants with cocaine dependence. No separate data available
McKay 2010	Ineligible population: already-abstinent participants in relapse prevention intervention
McKay 2013a	Ineligible population: already-treated participants with intensive outpatient programme (IOP); continuing aftercare intervention
McKay 2013b	Ineligible population: already-treated participants with intensive outpatient programme (IOP); continuing aftercare intervention
Metsch 2018	Ineligible intervention: intervention aimed to increase treatment adherence in HIV patients

Study	Reason for exclusion
Miller 1983	Ineligible intervention: comparison of bupropion, dextroamphetamine, and placebo in mixed-substance abusers
Monti 1997	Ineligible comparison: psychosocial intervention compared to relaxation and meditation
Mueser 2009	Ineligible population: participants with co-occurring substance use and severe psychiatric disorders; family intervention
Najavits 2018	Ineligible population: participants included alcohol-use disorder (75%), any drug use disorder (50%)
Norberg 2014	Ineligible population: occasional use of ecstasy
Ollo 1996	Ineligible intervention: diethylpropion treatment
Petry 2010	Ineligible population: participants with HIV and opioid or cocaine abuse or dependence; results for the subgroup of participants with cocaine abuse or dependence not reported
Petry 2011	Ineligible population: substance-abusing patients
Pirnia 2017	Ineligible population: "cocaine-dependent males during abstinence". Intervention aimed to prevent relapse
Polcin 2014	Ineligible comparison: compared the same intervention with two different intensities
Preston 2008	Ineligible comparison: compared the same intervention with two different types of CM
Rash 2008	Ineligible design: sub-analysis of three RCTs
Rawson 2021	Ineligible comparison: compared two different intensities of the same treatment
Rogers 2008	Ineligible population: already-abstinent participants
Rosen 2009	Ineligible population: veterans with psychiatric disorder, a substance-use disorder, or co-occurring psychiatric and substance-use disorders
Rosenblum 2005	Ineligible population: not all participants were cocaine abusers or dependent
Ruger 2012	Ineligible intervention: Well Woman Exam (WWE) and educational intervention
Santisteban 2011	Ineligible population: adolescents who met DSM-IV criteria for substance abuse disorder
Saxon 1996	Ineligible population: primary opiate abuse/dependence (89% of sample used heroin intravenously)
Schaub 2019	Ineligible intervention: non-standardised intervention
Schmitz 1997	Ineligible comparison: compared the same intervention with two different intensities
Silverman 2001	Ineligible population: not all participants were psychostimulant abusers or dependent
Stitzer 2010	Ineligible intervention: intervention aimed to increase hepatitis B vaccination amongst cocaine abusers
Van Horn 2011	Ineligible intervention: telephone continuing care with and without voucher incentives

Study	Reason for exclusion
Wardle 2015	Ineligible intervention: moderator effect of anhedonia on CM effect. Conference abstract
Wechsberg 2007	Ineligible intervention: personalised feedback about drug use and associated problems, information about the treatment process
Weddington 1991	Ineligible intervention: comparison of desipramine and amantadine
Weiss 2007	Ineligible population: bipolar disorder and current substance dependence
Winters 2000	Ineligible population: any drug abusers; no discrimination for cocaine users
Xu 2021	Ineligible intervention: transcranial direct current stimulation over prefrontal cortex combined with cognitive training
Zhu 2018	Ineligible intervention: mobile-based computerised cognitive addiction therapy app for the improvement of cognition impairments
Zlotnick 2009	Ineligible population: incarcerated women with substance use disorder and post-traumatic stress disorder

CM: contingency management; **RCT**: randomised controlled trial

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

IRCT20221018056234N1

Study name	Evaluation of the effects of motivational interviewing on beliefs related to substances, craving and desire for treatment in methamphetamine-dependent psychotic patients
Methods	Randomised controlled trial
Participants	32 psychotic patients with methamphetamine dependence
Interventions	1. Intervention group: single 50-minute motivational interview session 2. Control group: nothing is done
Outcomes	Primary outcomes: "The score of beliefs related to substances in the Beck and Wright questionnaire, The score of the questionnaire measuring the craving to use substances after leaving Federdi, Bararfan and Ziyai, The score of Miller and Tunigan stages of preparation for change and enthusiasm for addiction treatment questionnaire"
Starting date	
Contact information	
Notes	Country: Iran https://en.irct.ir/trial/66683

Mallorquí-Bagué 2023

Study name	

Mallorquí-Bagué 2023 *(Continued)*

Methods	Randomised controlled trial
Participants	70 (estimated) inpatients with cocaine use disorder
Interventions	1. Treatment as usual (TAU) + web-based CBT (CBT4CBT) 2. TAU
Outcomes	**Primary**: treatment dropout and cocaine use (number of positive urine specimens submitted, percent negative urine screens, percent days of abstinence, self-reported frequency of cocaine use). **Secondary**: sociodemographic variables and anthropometric measures (weight and high), cocaine craving, psychopathological symptoms and comorbidities, other addictive behaviors, personality traits, emotion regulation skills and CBT4CBT usability as well as treatment satisfaction.
Starting date	
Contact information	
Notes	Country: Europe Study completion: June 2024 (estimated) clinicaltrials.gov/study/NCT05207228

NCT00292110

Study name	
Methods	Randomised double-blind clinical trial
Participants	300 participants with opiate and cocaine-related disorders in a methadone clinic
Interventions	1. Contingency management with incentives given for cocaine abstinence, flexible methadone dosing to 190 mg/day daily orally 2. Contingency management with incentives given for cocaine abstinence and incentives given independent of drug use, methadone 100 mg/day orally 3. Flexible methadone dosing to 190 mg/day daily orally 4. Contingency management with incentives given independent of drug use, methadone 100 mg/day orally
Outcomes	Abstinence from cocaine and heroin, time to relapse, psychological and psychosocial outcome, HIV risk behaviours, QT interval (a measurement made on an electrocardiogram used to assess some of the electrical properties of the heart), urine microalbuminuria, blood lipid profile, quality of life, substance dependence, methadone plasma and saliva concentration, cortisol and prolactin levels
Starting date	
Contact information	
Notes	Country: USA Principal Investigator: Kenzie Preston, PhD The study was completed August 2013. Website accessed 8 March 2016.

NCT01401270

Study name	Prize contingency management for cocaine-dependent methadone patients
Methods	Randomised controlled trial
Participants	300 cocaine-dependent methadone patients
Interventions	1. Control group 2. Contingency management condition that arranges a 100% probability of winning a prize with each draw and has 3 prize categories 3. Contingency management condition that arranges a 31% probability of winning and has 3 prize categories 4. Contingency management condition that arranges a 100% probability of winning and has 7 prize categories 5. Contingency management condition that arranges a 31% probability of winning and has 7 prize categories 6. Usual prize contingency management with a 50% probability of winning from 3 prize categories
Outcomes	Longest continuous period of cocaine abstinence
Starting date	November 2011
Contact information	Sheila M Alessi, PhD, University of Connecticut Health Center
Notes	Country: USA

NCT01899313

Study name	A cognitive behavioral therapy-based text message intervention for methamphetamine dependence
Methods	Randomised cross-over trial
Participants	50 patients with methamphetamine addiction
Interventions	1. CBT-based SMS text messaging intervention 2. Placebo texts as add-on to CBT group therapy
Outcomes	Proportion of MA-negative urine samples between the 2-week CBT text period and the 2-week control period
Starting date	May 2014
Contact information	Gantt Galloway, PharmD California Pacific Medical Center
Notes	Country: USA

NCT01926184

Study name	RCT of an integrative intervention for non-treatment-seeking meth users (ARTEMIS)

NCT01926184 *(Continued)*

Methods	Randomised controlled trial
Participants	230 HIV-positive, methamphetamine-using men who have sex with men
Interventions	1. Affect Regulation Treatment to Enhance Meth Intervention Success (ARTEMIS) 2. Contingency management
Outcomes	HIV Viral Load, sustained HIV viral suppression, T-helper Count, methamphetamine and cocaine use, psychological adjustment, potentially amplified transmission risk behaviour
Starting date	January 2013
Contact information	Walter Gomez MA, walter.gomez@ucsf.edu
Notes	Country: USA

NCT01986075

Study name	A sequenced behavioral and medication intervention for cocaine dependence
Methods	Randomised controlled trial
Participants	155 treatment-seeking cocaine-dependent participants
Interventions	1. Computer-assisted therapy alone 2. Computer-assisted CBT + Adderall-XR 3. Computer-assisted CBT plus placebo
Outcomes	Cocaine abstinence after 3 weeks, dichotomous abstinence after 3 weeks: urine toxicology-confirmed self-reported abstinence, proportion of cocaine positive urine samples
Starting date	January 2014
Contact information	Frances R Levin, MD, Columbia University/New York State Psychiatric Institute
Notes	Country: USA

NCT04982796

Study name	
Methods	Randomised parallel-group controlled trial
Participants	30 participants with methamphetamine dependence
Interventions	Psilocybin-enhanced psychotherapy
Outcomes	Acceptability, dropout, methamphetamine use, disability, craving, depression
Starting date	7 July 2022
Contact information	Philip.Bouleh@va.gov

NCT04982796 *(Continued)*

Notes	

NCT05207228

Study name	Improvement of Cocaine Use Disorder Treatment Through Cognitive Behavioral Therapy Web-based Treatment (CBT4CBT)
Methods	Randomised controlled trial
Participants	70 (estimated) adults with cocaine use disorder
Interventions	1. Web-delivered CBT (CBT4CBT) plus treatment as usual (TAU) 2. TAU
Outcomes	**Primary:** relapse, assessing presence of benzoylecgonine (metabolite of cocaine), treatment retention **Secondary:** psychopathology, dependence and craving, anthropometric measures
Starting date	
Contact information	
Notes	Countries: Spain and Europe Study completion (estimated): June 2024 classic.clinicaltrials.gov/show/NCT05207228

NCT05593796

Study name	Cognitive Behavioral Therapy (CBT) in Treatment of Methamphetamine Use Disorder
Methods	Randomised controlled trial
Participants	50 (estimated) patients who meet the criteria for methamphetamine use disorder
Interventions	1. Clinician-delivered CBT plus treatment as usual (TAU) 2. TAU
Outcomes	Addiction severity index for methamphetamine use disorder
Starting date	
Contact information	
Notes	Country: Egypt Study completion (estimated): March 2025 clinicaltrials.gov/study/NCT05593796

NCT05854667

Study name	Clinical Trial of High Dose Lisdexamfetamine and Contingency Management in MA Users
Methods	Randomised controlled trial
Participants	400 (estimated) adults with moderate to severe methamphetamine (MA) use disorder
Interventions	1. Treatment as usual (TAU) plus placebo and contingency management (CM) 2. TAU plus placebo arm 3. TAU plus lisdexamfetamine (LDX-01) and CM 4. TAU plus lisdexamfetamine (LDX-01)
Outcomes	**Primary:** total number of days of methamphetamine use **Secondary:** medication adherence, safety events, changes in quality of life, MA and other substance use (self-report and urine drug screening), indigenous wellness perspective, treatment satisfaction
Starting date	December 2023
Contact information	
Notes	Country: Canada Study completion (estimated): November 2025 clinicaltrials.gov/study/NCT05854667

Shaub 2015

Study name	Snow Control 2.0 - web-based interventions for the reduction of cocaine use
Methods	Randomised controlled trial
Participants	432 problematic cocaine users
Interventions	1. Guided chat-counselling and web-based self-help 2. Web-based self-help alone 3. Waiting-list control condition
Outcomes	Weekly quantity of cocaine used; number of cocaine use days in the past 30 days; severity of cocaine dependence; use of alcohol, tobacco, or other illicit drugs; changes in mental health symptoms; treatment retention
Starting date	March 2015
Contact information	Dr Michael P Schaub, Konradstrasse 32, Zurich 8031, Switzerland
Notes	Country: Switzerland

CBT: cognitive behavioural therapy; **MA**: methamphetamines; **RCT:** randomised controlled trial

DATA AND ANALYSES

Comparison 1. Any psychosocial treatment versus no intervention

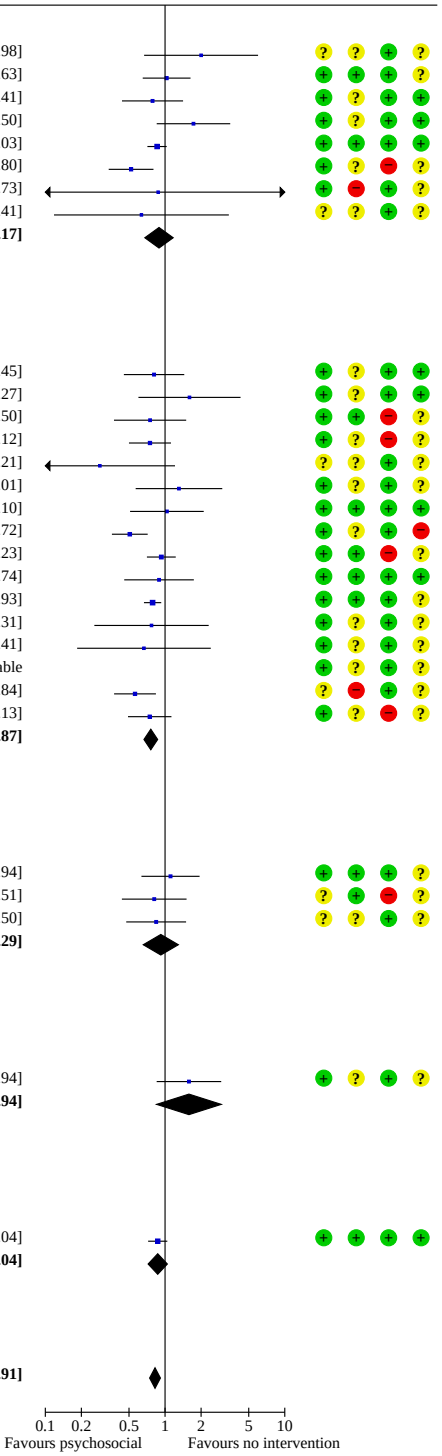
Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1.1 Dropouts	29	4049	Risk Ratio (M-H, Random, 95% CI)	0.82 [0.74, 0.91]
1.1.1 CBT	8	851	Risk Ratio (M-H, Random, 95% CI)	0.89 [0.68, 1.17]
1.1.2 Contingency management	16	2287	Risk Ratio (M-H, Random, 95% CI)	0.76 [0.67, 0.87]
1.1.3 Motivational interviewing	3	614	Risk Ratio (M-H, Random, 95% CI)	0.92 [0.66, 1.29]
1.1.4 12-step facilitation	1	112	Risk Ratio (M-H, Random, 95% CI)	1.58 [0.85, 2.94]
1.1.5 Psychodynamic therapy	1	185	Risk Ratio (M-H, Random, 95% CI)	0.87 [0.72, 1.04]
1.2 Point abstinence, end of treatment	12	1293	Risk Ratio (M-H, Random, 95% CI)	1.15 [0.94, 1.41]
1.2.1 CBT	4	454	Risk Ratio (M-H, Random, 95% CI)	1.05 [0.88, 1.25]
1.2.2 Contingency management	5	507	Risk Ratio (M-H, Random, 95% CI)	1.75 [0.92, 3.34]
1.2.3 12-step facilitation	1	112	Risk Ratio (M-H, Random, 95% CI)	0.84 [0.48, 1.46]
1.2.4 Psychodynamic therapy	1	185	Risk Ratio (M-H, Random, 95% CI)	1.05 [0.77, 1.44]
1.2.5 CBT + contingency management	1	35	Risk Ratio (M-H, Random, 95% CI)	2.08 [0.57, 7.55]
1.3 Point abstinence, longest follow-up	9	1187	Risk Ratio (M-H, Random, 95% CI)	1.22 [0.91, 1.62]
1.3.1 CBT	4	484	Risk Ratio (M-H, Random, 95% CI)	1.78 [0.98, 3.24]
1.3.2 Contingency management	2	141	Risk Ratio (M-H, Random, 95% CI)	1.06 [0.28, 3.98]
1.3.3 Psychodynamic therapy	1	185	Risk Ratio (M-H, Random, 95% CI)	0.95 [0.72, 1.27]
1.3.4 CBT + contingency management	1	35	Risk Ratio (M-H, Random, 95% CI)	1.15 [0.41, 3.28]
1.3.5 Motivational interviewing	1	342	Risk Ratio (M-H, Random, 95% CI)	1.17 [0.94, 1.46]
1.4 Continuous abstinence, end of treatment	12	1770	Risk Ratio (M-H, Random, 95% CI)	1.89 [1.20, 2.97]

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1.4.1 CBT	2	282	Risk Ratio (M-H, Random, 95% CI)	1.30 [0.51, 3.34]
1.4.2 Contingency management	9	1303	Risk Ratio (M-H, Random, 95% CI)	2.51 [1.43, 4.43]
1.4.4 Psychodynamic therapy	1	185	Risk Ratio (M-H, Random, 95% CI)	0.68 [0.38, 1.19]
1.5 Continuous abstinence, longest follow-up	3	266	Risk Ratio (M-H, Random, 95% CI)	1.14 [0.85, 1.54]
1.5.1 CBT	1	85	Risk Ratio (M-H, Random, 95% CI)	1.16 [0.93, 1.46]
1.5.2 Contingency management	2	181	Risk Ratio (M-H, Random, 95% CI)	1.88 [0.33, 10.61]
1.6 Frequency of drug intake, end of treatment	9	1186	Std. Mean Difference (IV, Random, 95% CI)	-0.35 [-0.51, -0.18]
1.6.1 CBT	3	133	Std. Mean Difference (IV, Random, 95% CI)	-0.49 [-1.06, 0.08]
1.6.2 Contingency management	5	711	Std. Mean Difference (IV, Random, 95% CI)	-0.39 [-0.56, -0.22]
1.6.3 Motivational interviewing	1	342	Std. Mean Difference (IV, Random, 95% CI)	-0.15 [-0.37, 0.06]
1.7 Longest period of abstinence	17	2118	Std. Mean Difference (IV, Random, 95% CI)	0.54 [0.41, 0.68]
1.7.1 CBT	5	440	Std. Mean Difference (IV, Random, 95% CI)	0.59 [0.23, 0.94]
1.7.2 Contingency management	12	1678	Std. Mean Difference (IV, Random, 95% CI)	0.54 [0.39, 0.69]
1.8 Craving	3	272	Std. Mean Difference (IV, Random, 95% CI)	-0.85 [-1.67, -0.03]
1.8.1 CBT	1	30	Std. Mean Difference (IV, Random, 95% CI)	-1.63 [-2.47, -0.79]
1.8.2 Contingency management	2	242	Std. Mean Difference (IV, Random, 95% CI)	-0.52 [-1.26, 0.22]
1.9 Severity of dependence	4	223	Std. Mean Difference (IV, Random, 95% CI)	-0.83 [-1.96, 0.30]
1.9.1 Contingency management	4	223	Std. Mean Difference (IV, Random, 95% CI)	-0.83 [-1.96, 0.30]
1.10 Depression	2	78	Std. Mean Difference (IV, Random, 95% CI)	-0.41 [-0.86, 0.04]

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1.10.1 CBT	1	41	Std. Mean Difference (IV, Random, 95% CI)	-0.28 [-0.90, 0.34]
1.10.2 Contingency management	1	37	Std. Mean Difference (IV, Random, 95% CI)	-0.56 [-1.22, 0.10]

Analysis 1.1. Comparison 1: Any psychosocial treatment versus no intervention, Outcome 1: Dropouts

Study or Subgroup	Any psychosocial intervention Events	Total	No intervention Events	Total	Weight	Risk Ratio M-H, Random, 95% CI	Risk of Bias A	B	C	D
1.1.1 CBT										
Baker 2001	8	32	4	32	0.9%	2.00 [0.67 , 5.98]	?	?	+	?
Baker 2005	39	140	20	74	3.9%	1.03 [0.65 , 1.63]	+	+	+	?
Carroll 2014	13	47	19	54	2.7%	0.79 [0.44 , 1.41]	+	?	+	+
Carroll 2018	19	66	9	54	1.9%	1.73 [0.85 , 3.50]	+	?	+	+
Crits-Christoph 1999 arm 1	79	119	48	62	11.1%	0.86 [0.71 , 1.03]	+	+	+	+
Higgins 2003	17	49	34	51	4.4%	0.52 [0.34 , 0.80]	+	?	−	?
Marsden 2018	1	16	1	14	0.1%	0.88 [0.06 , 12.73]	+	−	+	?
Mimiaga 2019	2	21	3	20	0.4%	0.63 [0.12 , 3.41]	?	?	+	?
Subtotal (95% CI)		**490**		**361**	**25.4%**	**0.89 [0.68 , 1.17]**				
Total events:	178		138							
Heterogeneity: Tau² = 0.05; Chi² = 12.27, df = 7 (P = 0.09); I² = 43%										
Test for overall effect: Z = 0.84 (P = 0.40)										
1.1.2 Contingency management										
Blanken 2016	17	107	21	107	2.7%	0.81 [0.45 , 1.45]	+	?	+	+
Carroll 2016	8	45	6	54	1.1%	1.60 [0.60 , 4.27]	+	?	+	+
Garcia-Fernandez 2011	9	29	12	29	2.0%	0.75 [0.37 , 1.50]	+	+	−	?
Hagedorn 2013	25	71	32	68	4.8%	0.75 [0.50 , 1.12]	+	?	−	?
Higgins 1994	2	20	7	20	0.5%	0.29 [0.07 , 1.21]	?	?	+	?
Kirby 1998	10	44	8	46	1.4%	1.31 [0.57 , 3.01]	+	?	+	?
Menza 2010	14	70	11	57	1.9%	1.04 [0.51 , 2.10]	+	+	+	+
Miguel 2017	16	32	32	32	6.0%	0.51 [0.36 , 0.72]	+	?	+	−
Peirce 2006	65	198	67	190	7.7%	0.93 [0.71 , 1.23]	+	+	−	?
Petitjean 2014	10	29	12	31	2.1%	0.89 [0.46 , 1.74]	+	+	+	+
Petry 2005a	107	209	134	206	12.0%	0.79 [0.67 , 0.93]	+	+	+	?
Petry 2005b	5	40	6	37	0.8%	0.77 [0.26 , 2.31]	+	?	+	?
Petry 2007	6	57	3	19	0.6%	0.67 [0.18 , 2.41]	+	?	+	?
Petry 2015	0	183	0	57		Not estimable	+	?	+	?
Roll 2013	31	89	18	29	4.8%	0.56 [0.38 , 0.84]	?	−	+	?
Secades Villa 2013	21	47	21	35	4.6%	0.74 [0.49 , 1.13]	+	?	−	?
Subtotal (95% CI)		**1270**		**1017**	**53.0%**	**0.76 [0.67 , 0.87]**				
Total events:	346		390							
Heterogeneity: Tau² = 0.01; Chi² = 16.69, df = 14 (P = 0.27); I² = 16%										
Test for overall effect: Z = 4.08 (P < 0.0001)										
1.1.3 Motivational interviewing										
Marsden 2006	22	166	21	176	2.9%	1.11 [0.64 , 1.94]	+	+	+	?
McKee 2007	12	38	14	36	2.4%	0.81 [0.44 , 1.51]	?	+	−	?
Stein 2009	17	97	21	101	2.7%	0.84 [0.47 , 1.50]	?	?	+	?
Subtotal (95% CI)		**301**		**313**	**8.0%**	**0.92 [0.66 , 1.29]**				
Total events:	51		56							
Heterogeneity: Tau² = 0.00; Chi² = 0.69, df = 2 (P = 0.71); I² = 0%										
Test for overall effect: Z = 0.47 (P = 0.64)										
1.1.4 12-step facilitation										
Carroll 2012	19	56	12	56	2.4%	1.58 [0.85 , 2.94]	+	?	+	?
Subtotal (95% CI)		**56**		**56**	**2.4%**	**1.58 [0.85 , 2.94]**				
Total events:	19		12							
Heterogeneity: Not applicable										
Test for overall effect: Z = 1.45 (P = 0.15)										
1.1.5 Psychodynamic therapy										
Crits-Christoph 1999 arm 2	83	124	47	61	11.2%	0.87 [0.72 , 1.04]	+	+	+	+
Subtotal (95% CI)		**124**		**61**	**11.2%**	**0.87 [0.72 , 1.04]**				
Total events:	83		47							
Heterogeneity: Not applicable										
Test for overall effect: Z = 1.49 (P = 0.14)										
Total (95% CI)		**2241**		**1808**	**100.0%**	**0.82 [0.74 , 0.91]**				
Total events:	677		643							
Heterogeneity: Tau² = 0.02; Chi² = 36.75, df = 27 (P = 0.10); I² = 27%										
Test for overall effect: Z = 3.64 (P = 0.0003)										
Test for subgroup differences: Chi² = 6.72, df = 4 (P = 0.15), I² = 40.5%										

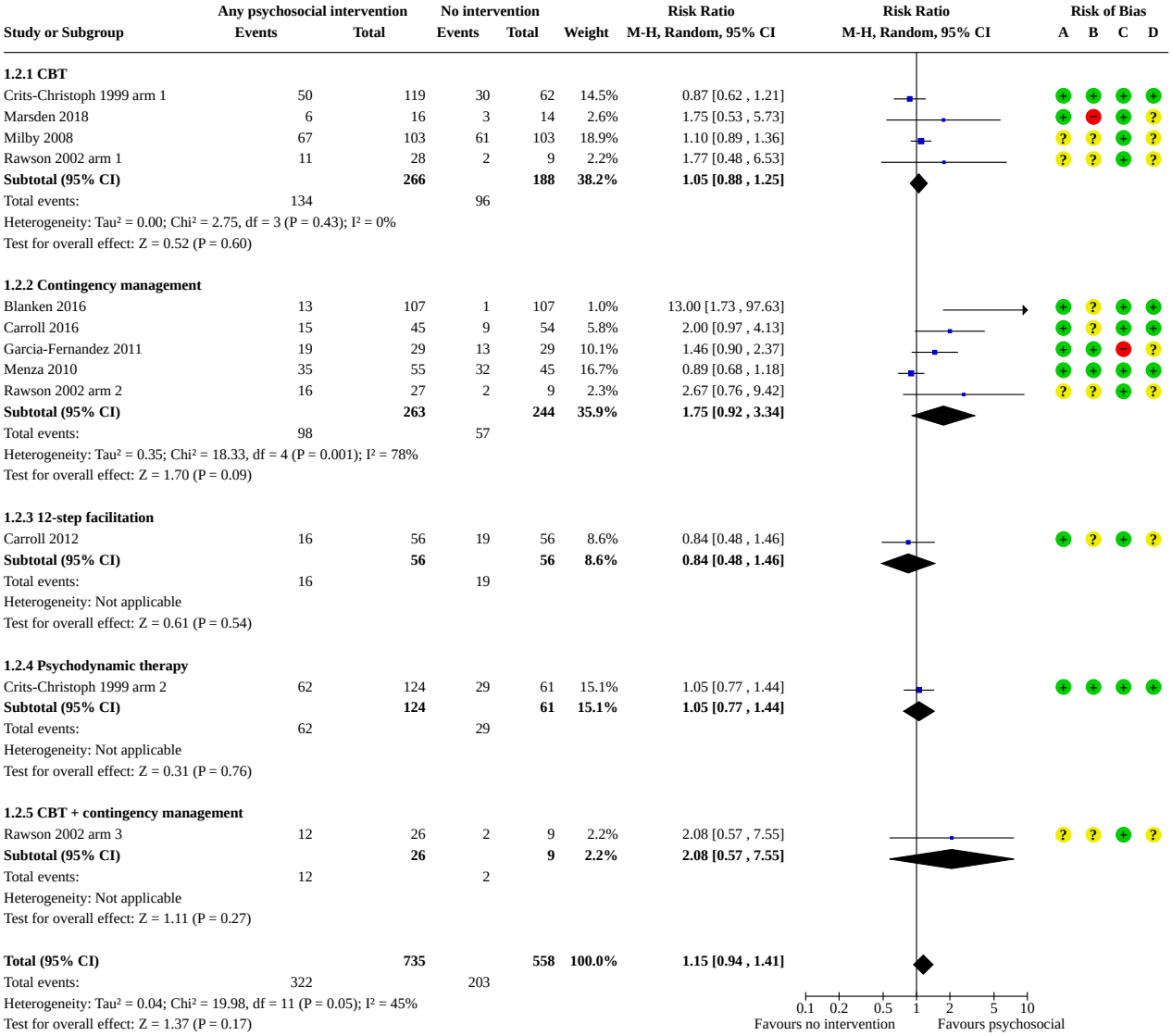


Risk of bias legend
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Incomplete outcome data (attrition bias)

Analysis 1.1. (Continued)

(B) Allocation concealment (selection bias)
(C) Incomplete outcome data (attrition bias)
(D) Selective reporting (reporting bias)

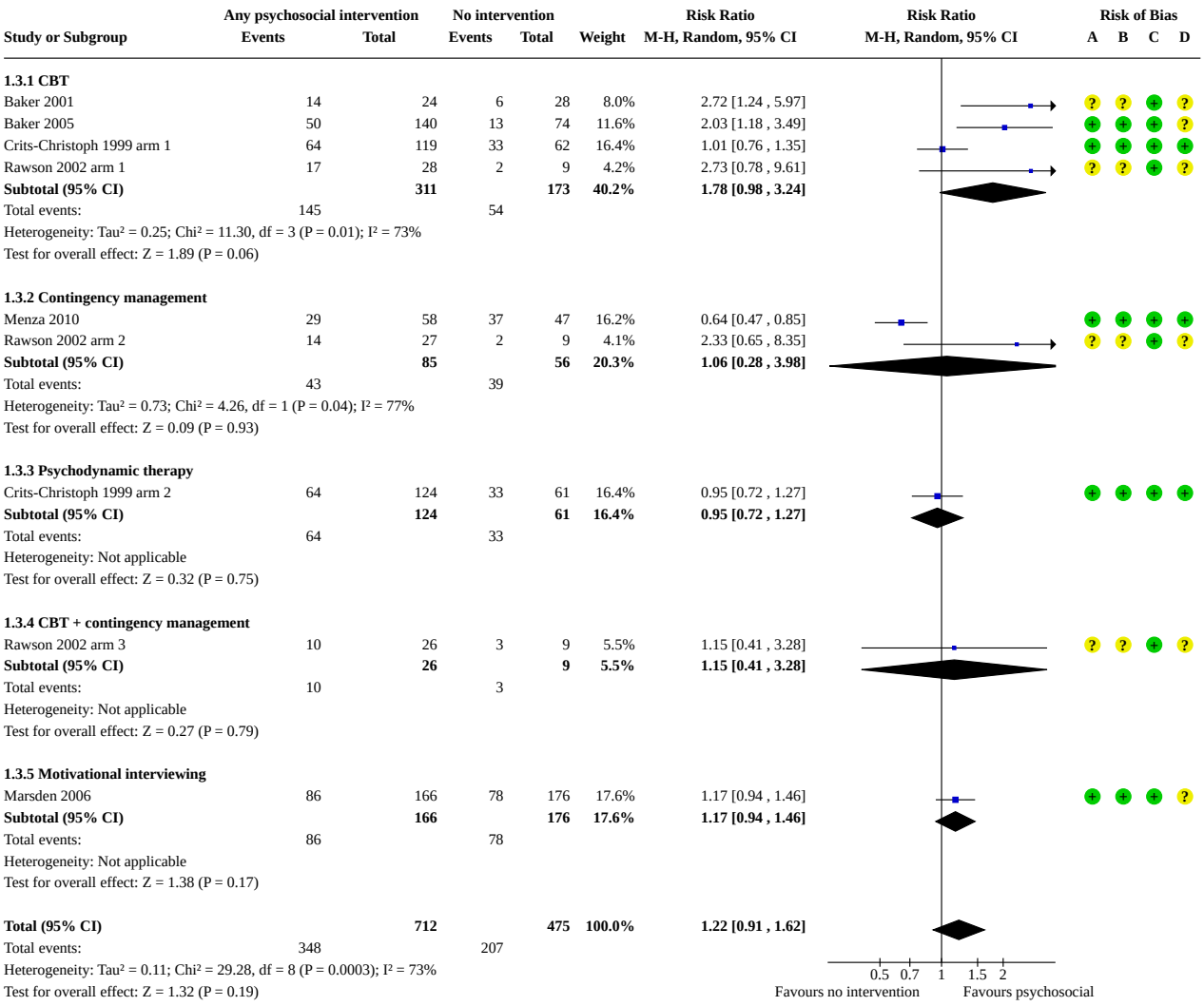
Analysis 1.2. Comparison 1: Any psychosocial treatment versus no intervention, Outcome 2: Point abstinence, end of treatment



Study or Subgroup	Any psychosocial intervention Events	Total	No intervention Events	Total	Weight	Risk Ratio M-H, Random, 95% CI	Risk of Bias A	B	C	D
1.2.1 CBT										
Crits-Christoph 1999 arm 1	50	119	30	62	14.5%	0.87 [0.62 , 1.21]	+	+	+	+
Marsden 2018	6	16	3	14	2.6%	1.75 [0.53 , 5.73]	+	−	+	?
Milby 2008	67	103	61	103	18.9%	1.10 [0.89 , 1.36]	?	?	+	?
Rawson 2002 arm 1	11	28	2	9	2.2%	1.77 [0.48 , 6.53]	?	?	+	?
Subtotal (95% CI)		**266**		**188**	**38.2%**	**1.05 [0.88 , 1.25]**				
Total events:	134		96							
Heterogeneity: Tau² = 0.00; Chi² = 2.75, df = 3 (P = 0.43); I² = 0%										
Test for overall effect: Z = 0.52 (P = 0.60)										
1.2.2 Contingency management										
Blanken 2016	13	107	1	107	1.0%	13.00 [1.73 , 97.63]	+	?	+	+
Carroll 2016	15	45	9	54	5.8%	2.00 [0.97 , 4.13]	+	?	+	+
Garcia-Fernandez 2011	19	29	13	29	10.1%	1.46 [0.90 , 2.37]	+	+	−	?
Menza 2010	35	55	32	45	16.7%	0.89 [0.68 , 1.18]	+	+	+	+
Rawson 2002 arm 2	16	27	2	9	2.3%	2.67 [0.76 , 9.42]	?	?	+	?
Subtotal (95% CI)		**263**		**244**	**35.9%**	**1.75 [0.92 , 3.34]**				
Total events:	98		57							
Heterogeneity: Tau² = 0.35; Chi² = 18.33, df = 4 (P = 0.001); I² = 78%										
Test for overall effect: Z = 1.70 (P = 0.09)										
1.2.3 12-step facilitation										
Carroll 2012	16	56	19	56	8.6%	0.84 [0.48 , 1.46]	+	?	+	?
Subtotal (95% CI)		**56**		**56**	**8.6%**	**0.84 [0.48 , 1.46]**				
Total events:	16		19							
Heterogeneity: Not applicable										
Test for overall effect: Z = 0.61 (P = 0.54)										
1.2.4 Psychodynamic therapy										
Crits-Christoph 1999 arm 2	62	124	29	61	15.1%	1.05 [0.77 , 1.44]	+	+	+	+
Subtotal (95% CI)		**124**		**61**	**15.1%**	**1.05 [0.77 , 1.44]**				
Total events:	62		29							
Heterogeneity: Not applicable										
Test for overall effect: Z = 0.31 (P = 0.76)										
1.2.5 CBT + contingency management										
Rawson 2002 arm 3	12	26	2	9	2.2%	2.08 [0.57 , 7.55]	?	?	+	?
Subtotal (95% CI)		**26**		**9**	**2.2%**	**2.08 [0.57 , 7.55]**				
Total events:	12		2							
Heterogeneity: Not applicable										
Test for overall effect: Z = 1.11 (P = 0.27)										
Total (95% CI)		**735**		**558**	**100.0%**	**1.15 [0.94 , 1.41]**				
Total events:	322		203							
Heterogeneity: Tau² = 0.04; Chi² = 19.98, df = 11 (P = 0.05); I² = 45%										
Test for overall effect: Z = 1.37 (P = 0.17)										
Test for subgroup differences: Chi² = 4.02, df = 4 (P = 0.40), I² = 0.6%										

Risk of bias legend
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Incomplete outcome data (attrition bias)
(D) Selective reporting (reporting bias)

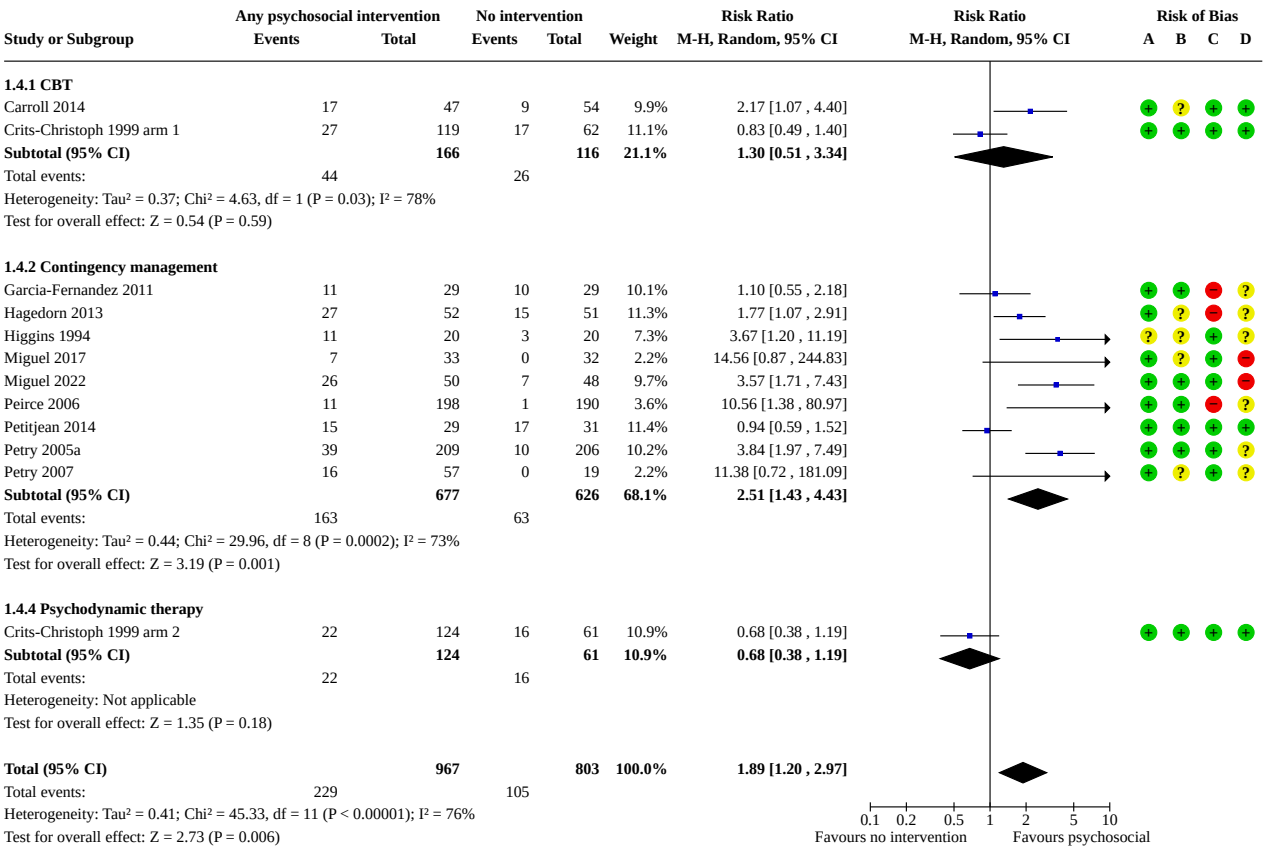
Analysis 1.3. Comparison 1: Any psychosocial treatment versus no intervention, Outcome 3: Point abstinence, longest follow-up



Study or Subgroup	Any psychosocial intervention Events	Total	No intervention Events	Total	Weight	Risk Ratio M-H, Random, 95% CI	Risk of Bias A	B	C	D
1.3.1 CBT										
Baker 2001	14	24	6	28	8.0%	2.72 [1.24 , 5.97]	?	?	+	?
Baker 2005	50	140	13	74	11.6%	2.03 [1.18 , 3.49]	+	+	+	?
Crits-Christoph 1999 arm 1	64	119	33	62	16.4%	1.01 [0.76 , 1.35]	+	+	+	+
Rawson 2002 arm 1	17	28	2	9	4.2%	2.73 [0.78 , 9.61]	?	?	+	?
Subtotal (95% CI)		**311**		**173**	**40.2%**	**1.78 [0.98 , 3.24]**				
Total events:	145		54							
Heterogeneity: Tau² = 0.25; Chi² = 11.30, df = 3 (P = 0.01); I² = 73%										
Test for overall effect: Z = 1.89 (P = 0.06)										
1.3.2 Contingency management										
Menza 2010	29	58	37	47	16.2%	0.64 [0.47 , 0.85]	+	+	+	+
Rawson 2002 arm 2	14	27	2	9	4.1%	2.33 [0.65 , 8.35]	?	?	+	?
Subtotal (95% CI)		**85**		**56**	**20.3%**	**1.06 [0.28 , 3.98]**				
Total events:	43		39							
Heterogeneity: Tau² = 0.73; Chi² = 4.26, df = 1 (P = 0.04); I² = 77%										
Test for overall effect: Z = 0.09 (P = 0.93)										
1.3.3 Psychodynamic therapy										
Crits-Christoph 1999 arm 2	64	124	33	61	16.4%	0.95 [0.72 , 1.27]	+	+	+	+
Subtotal (95% CI)		**124**		**61**	**16.4%**	**0.95 [0.72 , 1.27]**				
Total events:	64		33							
Heterogeneity: Not applicable										
Test for overall effect: Z = 0.32 (P = 0.75)										
1.3.4 CBT + contingency management										
Rawson 2002 arm 3	10	26	3	9	5.5%	1.15 [0.41 , 3.28]	?	?	+	?
Subtotal (95% CI)		**26**		**9**	**5.5%**	**1.15 [0.41 , 3.28]**				
Total events:	10		3							
Heterogeneity: Not applicable										
Test for overall effect: Z = 0.27 (P = 0.79)										
1.3.5 Motivational interviewing										
Marsden 2006	86	166	78	176	17.6%	1.17 [0.94 , 1.46]	+	+	+	?
Subtotal (95% CI)		**166**		**176**	**17.6%**	**1.17 [0.94 , 1.46]**				
Total events:	86		78							
Heterogeneity: Not applicable										
Test for overall effect: Z = 1.38 (P = 0.17)										
Total (95% CI)		**712**		**475**	**100.0%**	**1.22 [0.91 , 1.62]**				
Total events:	348		207							
Heterogeneity: Tau² = 0.11; Chi² = 29.28, df = 8 (P = 0.0003); I² = 73%										
Test for overall effect: Z = 1.32 (P = 0.19)										
Test for subgroup differences: Chi² = 3.65, df = 4 (P = 0.46), I² = 0%										

Risk of bias legend
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Incomplete outcome data (attrition bias)
(D) Selective reporting (reporting bias)

Analysis 1.4. Comparison 1: Any psychosocial treatment versus no intervention, Outcome 4: Continuous abstinence, end of treatment

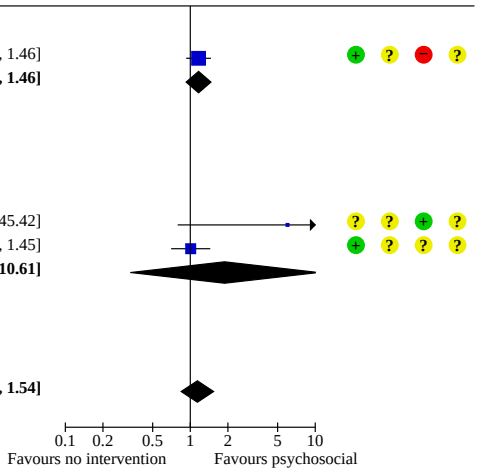


Study or Subgroup	Any psychosocial intervention Events	Total	No intervention Events	Total	Weight	Risk Ratio M-H, Random, 95% CI
1.4.1 CBT						
Carroll 2014	17	47	9	54	9.9%	2.17 [1.07 , 4.40]
Crits-Christoph 1999 arm 1	27	119	17	62	11.1%	0.83 [0.49 , 1.40]
Subtotal (95% CI)		**166**		**116**	**21.1%**	**1.30 [0.51 , 3.34]**
Total events:	44		26			
Heterogeneity: Tau² = 0.37; Chi² = 4.63, df = 1 (P = 0.03); I² = 78%						
Test for overall effect: Z = 0.54 (P = 0.59)						
1.4.2 Contingency management						
Garcia-Fernandez 2011	11	29	10	29	10.1%	1.10 [0.55 , 2.18]
Hagedorn 2013	27	52	15	51	11.3%	1.77 [1.07 , 2.91]
Higgins 1994	11	20	3	20	7.3%	3.67 [1.20 , 11.19]
Miguel 2017	7	33	0	32	2.2%	14.56 [0.87 , 244.83]
Miguel 2022	26	50	7	48	9.7%	3.57 [1.71 , 7.43]
Peirce 2006	11	198	1	190	3.6%	10.56 [1.38 , 80.97]
Petitjean 2014	15	29	17	31	11.4%	0.94 [0.59 , 1.52]
Petry 2005a	39	209	10	206	10.2%	3.84 [1.97 , 7.49]
Petry 2007	16	57	0	19	2.2%	11.38 [0.72 , 181.09]
Subtotal (95% CI)		**677**		**626**	**68.1%**	**2.51 [1.43 , 4.43]**
Total events:	163		63			
Heterogeneity: Tau² = 0.44; Chi² = 29.96, df = 8 (P = 0.0002); I² = 73%						
Test for overall effect: Z = 3.19 (P = 0.001)						
1.4.4 Psychodynamic therapy						
Crits-Christoph 1999 arm 2	22	124	16	61	10.9%	0.68 [0.38 , 1.19]
Subtotal (95% CI)		**124**		**61**	**10.9%**	**0.68 [0.38 , 1.19]**
Total events:	22		16			
Heterogeneity: Not applicable						
Test for overall effect: Z = 1.35 (P = 0.18)						
Total (95% CI)		**967**		**803**	**100.0%**	**1.89 [1.20 , 2.97]**
Total events:	229		105			
Heterogeneity: Tau² = 0.41; Chi² = 45.33, df = 11 (P < 0.00001); I² = 76%						
Test for overall effect: Z = 2.73 (P = 0.006)						
Test for subgroup differences: Chi² = 10.32, df = 2 (P = 0.006), I² = 80.6%						

Risk of bias legend
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Incomplete outcome data (attrition bias)
(D) Selective reporting (reporting bias)

Analysis 1.5. Comparison 1: Any psychosocial treatment versus no intervention, Outcome 5: Continuous abstinence, longest follow-up

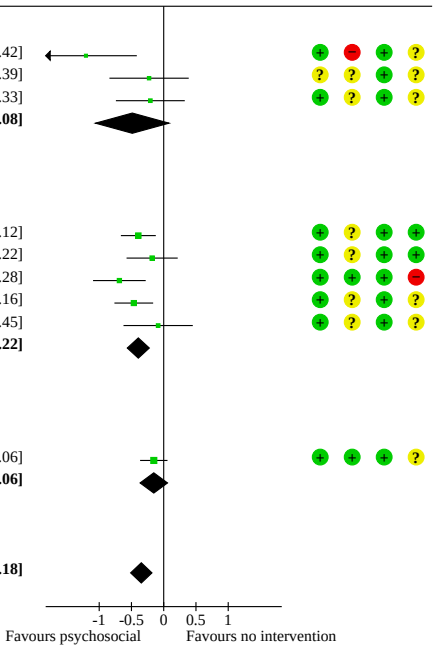
Study or Subgroup	Any psychosocial intervention Events	Total	No intervention Events	Total	Weight	Risk Ratio M-H, Random, 95% CI	Risk of Bias A	B	C	D
1.5.1 CBT										
Higgins 2003	38	45	29	40	58.9%	1.16 [0.93 , 1.46]	+	?	−	?
Subtotal (95% CI)		**45**		**40**	**58.9%**	**1.16 [0.93 , 1.46]**				
Total events:	38		29							
Heterogeneity: Not applicable										
Test for overall effect: Z = 1.31 (P = 0.19)										
1.5.2 Contingency management										
Higgins 1994	6	20	1	20	2.1%	6.00 [0.79 , 45.42]	?	?	+	?
Petry 2018	37	80	28	61	38.9%	1.01 [0.70 , 1.45]	+	?	?	?
Subtotal (95% CI)		**100**		**81**	**41.1%**	**1.88 [0.33 , 10.61]**				
Total events:	43		29							
Heterogeneity: Tau² = 1.17; Chi² = 3.12, df = 1 (P = 0.08); I² = 68%										
Test for overall effect: Z = 0.71 (P = 0.47)										
Total (95% CI)		**145**		**121**	**100.0%**	**1.14 [0.85 , 1.54]**				
Total events:	81		58							
Heterogeneity: Tau² = 0.03; Chi² = 3.13, df = 2 (P = 0.21); I² = 36%										
Test for overall effect: Z = 0.86 (P = 0.39)										
Test for subgroup differences: Chi² = 0.29, df = 1 (P = 0.59), I² = 0%										



Risk of bias legend
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Incomplete outcome data (attrition bias)
(D) Selective reporting (reporting bias)

Analysis 1.6. Comparison 1: Any psychosocial treatment versus no intervention, Outcome 6: Frequency of drug intake, end of treatment

Study or Subgroup	Any psychosocial intervention Mean	SD	Total	No intervention Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI	Risk of Bias A	B	C	D
1.6.1 CBT												
Marsden 2018	14.6	18.96	16	45.41	30.29	14	3.9%	-1.21 [-1.99 , -0.42]	+	−	+	?
Mimiaga 2019	3.1	5.6	21	4.5	6.5	20	5.9%	-0.23 [-0.84 , 0.39]	?	?	+	?
Shoptaw 2005 arm 2	1.7	5.1	20	2.7	4.6	42	7.4%	-0.21 [-0.74 , 0.33]	+	?	+	?
Subtotal (95% CI)			**57**			**76**	**17.1%**	**-0.49 [-1.06 , 0.08]**				
Heterogeneity: Tau² = 0.15; Chi² = 4.80, df = 2 (P = 0.09); I² = 58%												
Test for overall effect: Z = 1.67 (P = 0.09)												
1.6.2 Contingency management												
Blanken 2016	19.75	8.24	107	22.38	4.57	107	17.2%	-0.39 [-0.66 , -0.12]	+	?	+	+
Carroll 2016	19.88	24.57	45	24.17	22.99	54	11.2%	-0.18 [-0.58 , 0.22]	+	?	+	+
Miguel 2022	7.65	4.7	50	10.5	3.4	48	10.8%	-0.69 [-1.10 , -0.28]	+	+	+	−
Petry 2015	8.6	3.9	183	10.3	2.7	57	15.5%	-0.46 [-0.76 , -0.16]	+	?	+	?
Shoptaw 2005 arm 3	1.7	5.1	20	2.2	6	40	7.3%	-0.09 [-0.62 , 0.45]	+	?	+	?
Subtotal (95% CI)			**405**			**306**	**62.0%**	**-0.39 [-0.56 , -0.22]**				
Heterogeneity: Tau² = 0.00; Chi² = 4.58, df = 4 (P = 0.33); I² = 13%												
Test for overall effect: Z = 4.53 (P < 0.00001)												
1.6.3 Motivational interviewing												
Marsden 2006	5.54	11.5	166	7.4	12.6	176	20.9%	-0.15 [-0.37 , 0.06]	+	+	+	?
Subtotal (95% CI)			**166**			**176**	**20.9%**	**-0.15 [-0.37 , 0.06]**				
Heterogeneity: Not applicable												
Test for overall effect: Z = 1.42 (P = 0.16)												
Total (95% CI)			**628**			**558**	**100.0%**	**-0.35 [-0.51 , -0.18]**				
Heterogeneity: Tau² = 0.02; Chi² = 12.94, df = 8 (P = 0.11); I² = 38%												
Test for overall effect: Z = 4.12 (P < 0.0001)												
Test for subgroup differences: Chi² = 3.38, df = 2 (P = 0.18), I² = 40.9%												

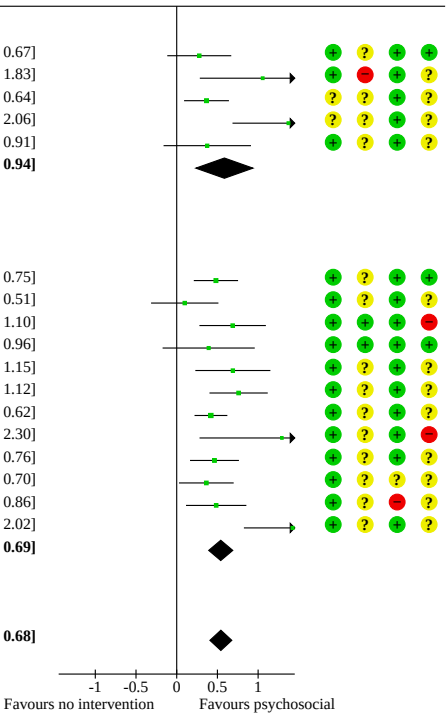


Risk of bias legend

(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Incomplete outcome data (attrition bias)
(D) Selective reporting (reporting bias)

Analysis 1.7. Comparison 1: Any psychosocial treatment versus no intervention, Outcome 7: Longest period of abstinence

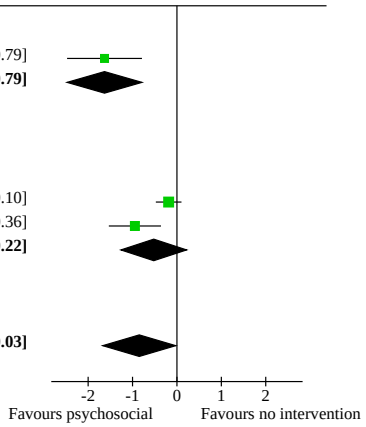
Study or Subgroup	Any psychosocial intervention Mean	SD	Total	No intervention Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI	Risk of Bias A	B	C	D
1.7.1 CBT												
Carroll 2014	65.3	29.4	47	56.6	32.6	54	6.3%	0.28 [-0.12 , 0.67]	+	?	+	+
Marsden 2018	15.69	10.1	16	6	7.34	14	2.5%	1.06 [0.28 , 1.83]	+	−	+	?
Milby 2008	19.18	16	103	13.89	12.6	103	8.7%	0.37 [0.09 , 0.64]	?	?	+	?
Mimiaga 2019	40.6	1.5	21	38.5	1.5	20	3.0%	1.37 [0.69 , 2.06]	?	?	+	?
Shoptaw 2005 arm 2	7	5.2	20	5.1	4.9	42	4.3%	0.38 [-0.16 , 0.91]	+	?	+	?
Subtotal (95% CI)			**207**			**233**	**24.8%**	**0.59 [0.23 , 0.94]**				
Heterogeneity: Tau² = 0.09; Chi² = 10.43, df = 4 (P = 0.03); I² = 62%												
Test for overall effect: Z = 3.27 (P = 0.001)												
1.7.2 Contingency management												
Blanken 2016	3.72	5.84	107	1.59	2.17	107	8.8%	0.48 [0.21 , 0.75]	+	?	+	+
Kirby 1998	2.7	2.8	44	2.4	3.2	46	6.0%	0.10 [-0.31 , 0.51]	+	?	+	?
Miguel 2022	4.35	4.7	50	1.5	3.4	48	6.1%	0.69 [0.28 , 1.10]	+	+	+	−
Petitjean 2014	11.54	9.6	25	7.83	8.97	24	4.0%	0.39 [-0.17 , 0.96]	+	+	+	+
Petry 2005b	2.9	3.7947	40	0.8	1.8248	37	5.3%	0.69 [0.23 , 1.15]	+	?	+	?
Petry 2012a	4.7	4.7	71	1.7	2.7	59	7.0%	0.76 [0.40 , 1.12]	+	?	+	?
Petry 2012b	4.95	4.39	300	3.22	3.43	142	10.5%	0.42 [0.22 , 0.62]	+	?	+	?
Petry 2013	2.9	1.7	10	0.6	1.7	9	1.6%	1.29 [0.28 , 2.30]	+	?	+	−
Petry 2015	3.4	3.9	183	1.7	2.7	57	8.2%	0.46 [0.16 , 0.76]	+	?	+	?
Petry 2018	33.6	28.9	80	23.2	27.8	61	7.4%	0.36 [0.03 , 0.70]	+	?	?	?
Secades Villa 2013	3.1	2.4	50	1.9	2.5	68	6.7%	0.48 [0.11 , 0.86]	+	?	−	?
Shoptaw 2005 arm 3	7	5.2	20	2.1	2	40	3.7%	1.42 [0.83 , 2.02]	+	?	+	?
Subtotal (95% CI)			**980**			**698**	**75.2%**	**0.54 [0.39 , 0.69]**				
Heterogeneity: Tau² = 0.03; Chi² = 20.04, df = 11 (P = 0.04); I² = 45%												
Test for overall effect: Z = 7.18 (P < 0.00001)												
Total (95% CI)			**1187**			**931**	**100.0%**	**0.54 [0.41 , 0.68]**				
Heterogeneity: Tau² = 0.03; Chi² = 30.60, df = 16 (P = 0.02); I² = 48%												
Test for overall effect: Z = 7.92 (P < 0.00001)												
Test for subgroup differences: Chi² = 0.05, df = 1 (P = 0.82), I² = 0%												



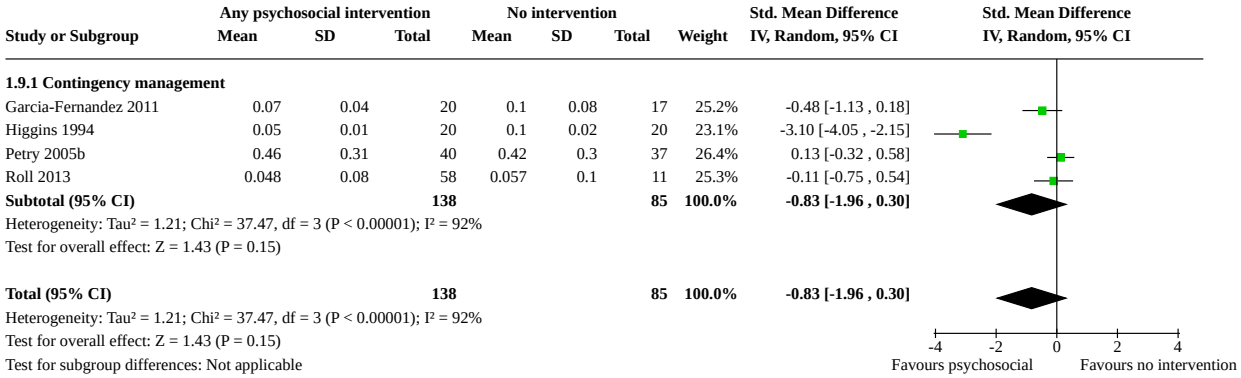
Risk of bias legend
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Incomplete outcome data (attrition bias)
(D) Selective reporting (reporting bias)

Analysis 1.8. Comparison 1: Any psychosocial treatment versus no intervention, Outcome 8: Craving

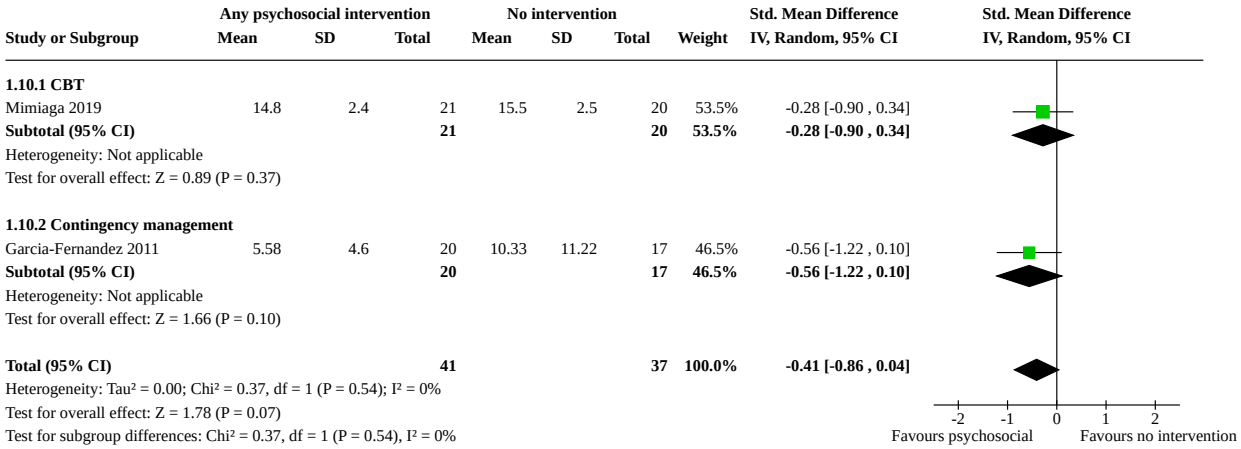
Study or Subgroup	Any psychosocial intervention Mean	SD	Total	No intervention Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
1.8.1 CBT								
Marsden 2018	14.77	21.47	16	51.75	22.72	14	28.3%	-1.63 [-2.47 , -0.79]
Subtotal (95% CI)			**16**			**14**	**28.3%**	**-1.63 [-2.47 , -0.79]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 3.79 (P = 0.0001)								
1.8.2 Contingency management								
Festinger 2014	16.11	5.71	114	17.26	6.72	78	38.3%	-0.19 [-0.48 , 0.10]
Pirnia 2016	14.79	2.29	25	17.24	2.78	25	33.4%	-0.95 [-1.53 , -0.36]
Subtotal (95% CI)			**139**			**103**	**71.7%**	**-0.52 [-1.26 , 0.22]**
Heterogeneity: Tau² = 0.23; Chi² = 5.19, df = 1 (P = 0.02); I² = 81%								
Test for overall effect: Z = 1.38 (P = 0.17)								
Total (95% CI)			**155**			**117**	**100.0%**	**-0.85 [-1.67 , -0.03]**
Heterogeneity: Tau² = 0.44; Chi² = 13.49, df = 2 (P = 0.001); I² = 85%								
Test for overall effect: Z = 2.02 (P = 0.04)								
Test for subgroup differences: Chi² = 3.76, df = 1 (P = 0.05), I² = 73.4%								



Analysis 1.9. Comparison 1: Any psychosocial treatment versus no intervention, Outcome 9: Severity of dependence



Analysis 1.10. Comparison 1: Any psychosocial treatment versus no intervention, Outcome 10: Depression



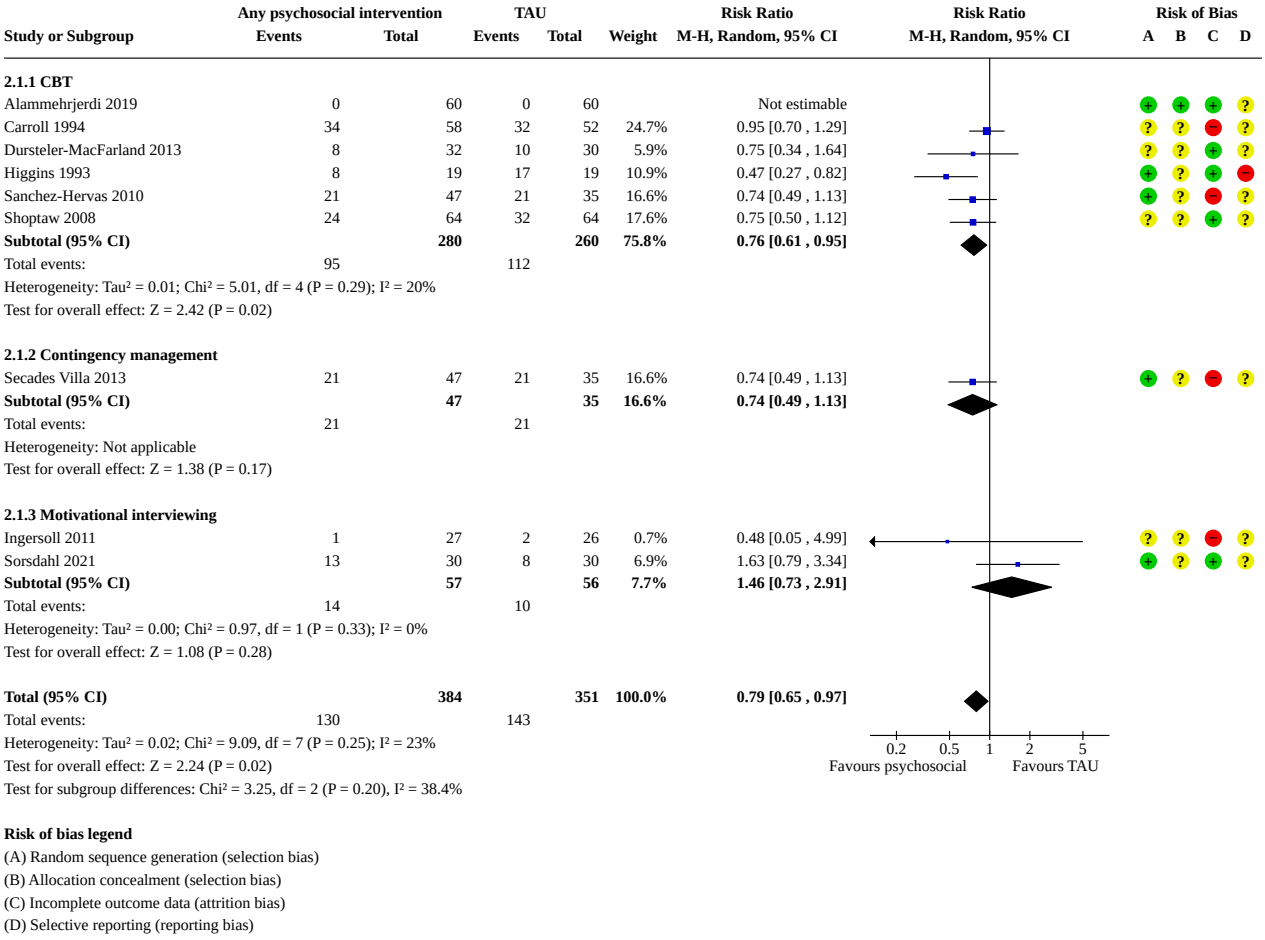
Comparison 2. Any psychosocial treatment versus treatment as usual (TAU)

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
2.1 Dropouts	9	735	Risk Ratio (M-H, Random, 95% CI)	0.79 [0.65, 0.97]
2.1.1 CBT	6	540	Risk Ratio (M-H, Random, 95% CI)	0.76 [0.61, 0.95]
2.1.2 Contingency management	1	82	Risk Ratio (M-H, Random, 95% CI)	0.74 [0.49, 1.13]
2.1.3 Motivational interviewing	2	113	Risk Ratio (M-H, Random, 95% CI)	1.46 [0.73, 2.91]
2.2 Point abstinence, end of treatment	1	128	Risk Ratio (M-H, Random, 95% CI)	1.67 [0.64, 4.31]
2.2.1 CBT	1	128	Risk Ratio (M-H, Random, 95% CI)	1.67 [0.64, 4.31]

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
2.3 Point abstinence, longest follow up	2	124	Risk Ratio (M-H, Random, 95% CI)	1.31 [0.86, 1.99]
2.3.1 CBT	1	82	Risk Ratio (M-H, Random, 95% CI)	1.65 [0.86, 3.18]
2.3.2 Motivational interviewing	1	42	Risk Ratio (M-H, Random, 95% CI)	1.11 [0.64, 1.92]
2.4 Continuous abstinence, end of treatment	1	128	Risk Ratio (M-H, Random, 95% CI)	1.18 [0.92, 1.53]
2.4.1 CBT	1	128	Risk Ratio (M-H, Random, 95% CI)	1.18 [0.92, 1.53]
2.5 Frequency of drug intake, end of treatment	4	479	Std. Mean Difference (IV, Random, 95% CI)	-1.17 [-2.81, 0.47]
2.5.1 CBT	1	120	Std. Mean Difference (IV, Random, 95% CI)	-4.76 [-5.47, -4.05]
2.5.2 Motivational interviewing	1	39	Std. Mean Difference (IV, Random, 95% CI)	-0.25 [-0.89, 0.38]
2.5.3 Motivational interviewing + CBT	1	210	Std. Mean Difference (IV, Random, 95% CI)	0.07 [-0.20, 0.34]
2.5.4 Interpersonal therapy	1	110	Std. Mean Difference (IV, Random, 95% CI)	0.15 [-0.22, 0.53]
2.6 Longest period of abstinence	1	110	Std. Mean Difference (IV, Random, 95% CI)	-0.16 [-0.54, 0.21]
2.6.1 CBT	1	110	Std. Mean Difference (IV, Random, 95% CI)	-0.16 [-0.54, 0.21]
2.7 Craving	1	39	Std. Mean Difference (IV, Random, 95% CI)	-0.18 [-0.81, 0.46]
2.7.2 Motivational interviewing	1	39	Std. Mean Difference (IV, Random, 95% CI)	-0.18 [-0.81, 0.46]
2.8 Severity of dependence (ASI)	6	509	Std. Mean Difference (IV, Random, 95% CI)	-0.42 [-1.15, 0.32]
2.8.1 CBT	3	312	Std. Mean Difference (IV, Random, 95% CI)	-0.89 [-2.10, 0.32]
2.8.2 Motivational interviewing	2	79	Std. Mean Difference (IV, Random, 95% CI)	0.02 [-0.63, 0.67]
2.8.3 Contingency management	1	118	Std. Mean Difference (IV, Random, 95% CI)	0.18 [-0.24, 0.60]
2.9 Depression	1	39	Std. Mean Difference (IV, Fixed, 95% CI)	-0.16 [-0.80, 0.47]

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
2.9.1 Motivational interviewing	1	39	Std. Mean Difference (IV, Fixed, 95% CI)	-0.16 [-0.80, 0.47]

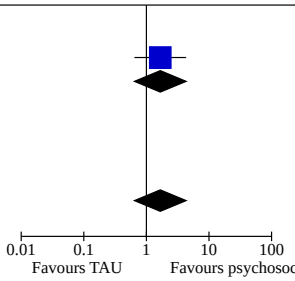
Analysis 2.1. Comparison 2: Any psychosocial treatment versus treatment as usual (TAU), Outcome 1: Dropouts



Risk of bias legend
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Incomplete outcome data (attrition bias)
(D) Selective reporting (reporting bias)

Analysis 2.2. Comparison 2: Any psychosocial treatment versus treatment as usual (TAU), Outcome 2: Point abstinence, end of treatment

Study or Subgroup	Any psychosocial intervention Events	Total	TAU Events	Total	Weight	Risk Ratio M-H, Random, 95% CI
2.2.1 CBT						
Shoptaw 2008	10	64	6	64	100.0%	1.67 [0.64 , 4.31]
Subtotal (95% CI)		**64**		**64**	**100.0%**	**1.67 [0.64 , 4.31]**
Total events:	10		6			
Heterogeneity: Not applicable						
Test for overall effect: Z = 1.05 (P = 0.29)						
Total (95% CI)		**64**		**64**	**100.0%**	**1.67 [0.64 , 4.31]**
Total events:	10		6			
Heterogeneity: Not applicable						
Test for overall effect: Z = 1.05 (P = 0.29)						
Test for subgroup differences: Not applicable						

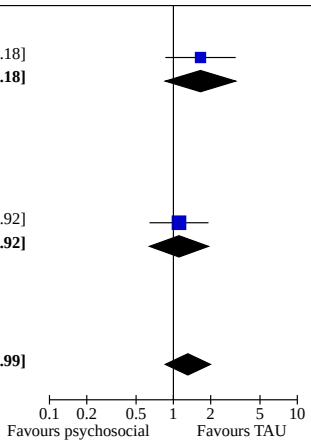


Risk of Bias: A ? B ? C + D ?

Risk of bias legend
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Incomplete outcome data (attrition bias)
(D) Selective reporting (reporting bias)

Analysis 2.3. Comparison 2: Any psychosocial treatment versus treatment as usual (TAU), Outcome 3: Point abstinence, longest follow up

Study or Subgroup	Any psychosocial intervention Events	Total	TAU Events	Total	Weight	Risk Ratio M-H, Random, 95% CI
2.3.1 CBT						
Sanchez-Hervas 2010	20	47	9	35	41.3%	1.65 [0.86 , 3.18]
Subtotal (95% CI)		**47**		**35**	**41.3%**	**1.65 [0.86 , 3.18]**
Total events:	20		9			
Heterogeneity: Not applicable						
Test for overall effect: Z = 1.51 (P = 0.13)						
2.3.2 Motivational interviewing						
Ingersoll 2011	11	19	12	23	58.7%	1.11 [0.64 , 1.92]
Subtotal (95% CI)		**19**		**23**	**58.7%**	**1.11 [0.64 , 1.92]**
Total events:	11		12			
Heterogeneity: Not applicable						
Test for overall effect: Z = 0.37 (P = 0.71)						
Total (95% CI)		**66**		**58**	**100.0%**	**1.31 [0.86 , 1.99]**
Total events:	31		21			
Heterogeneity: Tau² = 0.00; Chi² = 0.90, df = 1 (P = 0.34); I² = 0%						
Test for overall effect: Z = 1.26 (P = 0.21)						
Test for subgroup differences: Chi² = 0.84, df = 1 (P = 0.36), I² = 0%						

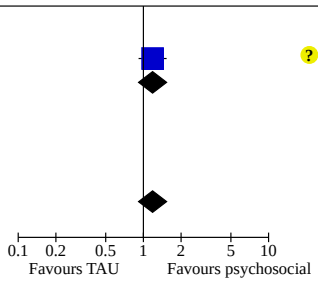


Risk of Bias: ? ? − ?

Risk of bias legend
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Incomplete outcome data (attrition bias)
(D) Selective reporting (reporting bias)

Analysis 2.4. Comparison 2: Any psychosocial treatment versus treatment as usual (TAU), Outcome 4: Continuous abstinence, end of treatment

Study or Subgroup	Any psychosocial intervention Events	Total	TAU Events	Total	Weight	Risk Ratio M-H, Random, 95% CI
2.4.1 CBT						
Shoptaw 2008	45	64	38	64	100.0%	1.18 [0.92 , 1.53]
Subtotal (95% CI)		**64**		**64**	**100.0%**	**1.18 [0.92 , 1.53]**
Total events:	45		38			
Heterogeneity: Not applicable						
Test for overall effect: Z = 1.29 (P = 0.20)						
Total (95% CI)		**64**		**64**	**100.0%**	**1.18 [0.92 , 1.53]**
Total events:	45		38			
Heterogeneity: Not applicable						
Test for overall effect: Z = 1.29 (P = 0.20)						
Test for subgroup differences: Not applicable						

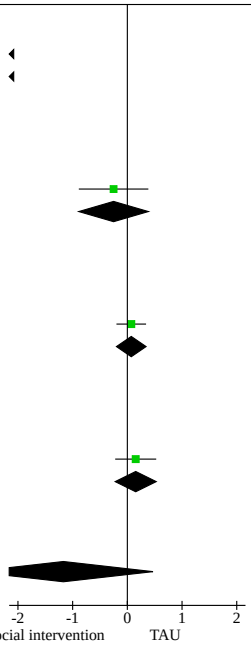


Risk of Bias	A	B	C	D
Shoptaw 2008	?	?	+	?

Risk of bias legend
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Incomplete outcome data (attrition bias)
(D) Selective reporting (reporting bias)

Analysis 2.5. Comparison 2: Any psychosocial treatment versus treatment as usual (TAU), Outcome 5: Frequency of drug intake, end of treatment

Study or Subgroup	Any psychosocial intervention Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
2.5.1 CBT								
Alammehrjerdi 2019	5.2	3.77	60	18.8	1.39	60	24.5%	-4.76 [-5.47 , -4.05]
Subtotal (95% CI)			**60**			**60**	**24.5%**	**-4.76 [-5.47 , -4.05]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 13.15 (P < 0.00001)								
2.5.2 Motivational interviewing								
Sorsdahl 2021	4.83	7.86	17	6.43	4.62	22	24.7%	-0.25 [-0.89 , 0.38]
Subtotal (95% CI)			**17**			**22**	**24.7%**	**-0.25 [-0.89 , 0.38]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.78 (P = 0.44)								
2.5.3 Motivational interviewing + CBT								
Parsons 2018	2.21	4.49	105	1.93	3.18	105	25.5%	0.07 [-0.20 , 0.34]
Subtotal (95% CI)			**105**			**105**	**25.5%**	**0.07 [-0.20 , 0.34]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.52 (P = 0.60)								
2.5.4 Interpersonal therapy								
Carroll 1991	0.27	0.19	58	0.24	0.2	52	25.3%	0.15 [-0.22 , 0.53]
Subtotal (95% CI)			**58**			**52**	**25.3%**	**0.15 [-0.22 , 0.53]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.80 (P = 0.42)								
Total (95% CI)			**240**			**239**	**100.0%**	**-1.17 [-2.81 , 0.47]**
Heterogeneity: Tau² = 2.73; Chi² = 164.68, df = 3 (P < 0.00001); I² = 98%								
Test for overall effect: Z = 1.40 (P = 0.16)								
Test for subgroup differences: Chi² = 164.68, df = 3 (P < 0.00001), I² = 98.2%								

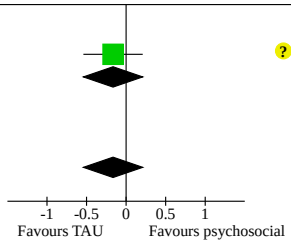


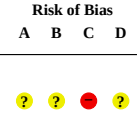
Risk of Bias	A	B	C	D
Alammehrjerdi 2019	+	+	+	?
Sorsdahl 2021	+	?	+	?
Parsons 2018	+	?	+	?
Carroll 1991	?	?	−	?

Risk of bias legend
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Incomplete outcome data (attrition bias)
(D) Selective reporting (reporting bias)

Analysis 2.6. Comparison 2: Any psychosocial treatment versus treatment as usual (TAU), Outcome 6: Longest period of abstinence

Study or Subgroup	Any psychosocial intervention Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
2.6.1 CBT								
Carroll 1994	19.25	16.5	58	22.4	21.4	52	100.0%	-0.16 [-0.54 , 0.21]
Subtotal (95% CI)			**58**			**52**	**100.0%**	**-0.16 [-0.54 , 0.21]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.86 (P = 0.39)								
Total (95% CI)			**58**			**52**	**100.0%**	**-0.16 [-0.54 , 0.21]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.86 (P = 0.39)								
Test for subgroup differences: Not applicable								

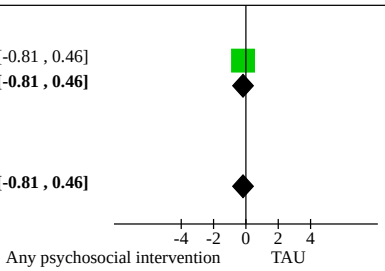




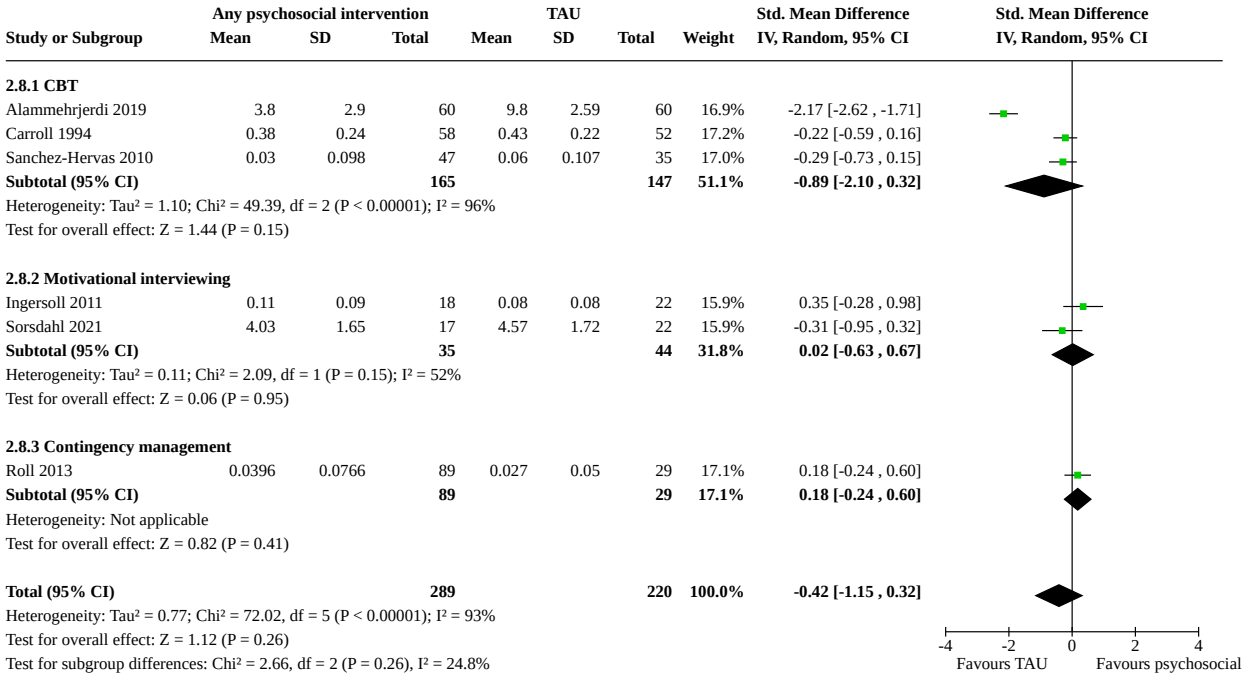
Risk of bias legend
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Incomplete outcome data (attrition bias)
(D) Selective reporting (reporting bias)

Analysis 2.7. Comparison 2: Any psychosocial treatment versus treatment as usual (TAU), Outcome 7: Craving

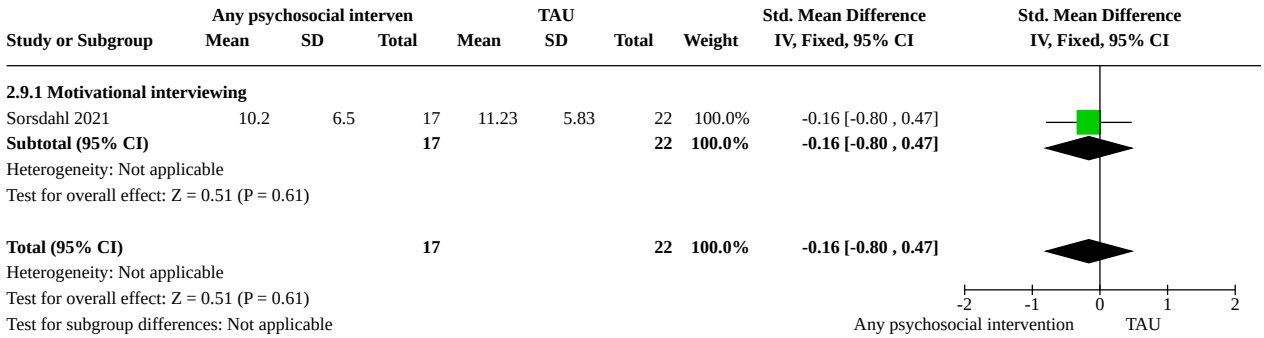
Study or Subgroup	Any psychosocial intervention Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
2.7.2 Motivational interviewing								
Sorsdahl 2021	15.97	7.61	17	17.43	8.35	22	100.0%	-0.18 [-0.81 , 0.46]
Subtotal (95% CI)			**17**			**22**	**100.0%**	**-0.18 [-0.81 , 0.46]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.55 (P = 0.58)								
Total (95% CI)			**17**			**22**	**100.0%**	**-0.18 [-0.81 , 0.46]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.55 (P = 0.58)								
Test for subgroup differences: Not applicable								



Analysis 2.8. Comparison 2: Any psychosocial treatment versus treatment as usual (TAU), Outcome 8: Severity of dependence (ASI)



Analysis 2.9. Comparison 2: Any psychosocial treatment versus treatment as usual (TAU), Outcome 9: Depression



Comparison 3. Contingency management (CM) reinforcement versus non-contingency management (non-CM) reinforcement

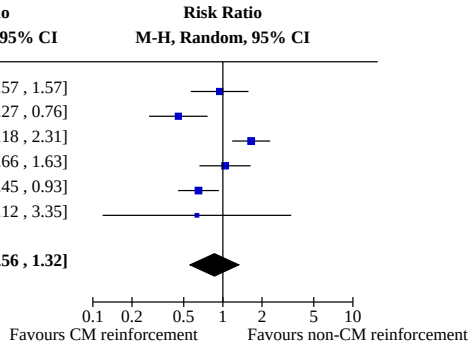
Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
3.1 Dropouts	6	704	Risk Ratio (M-H, Random, 95% CI)	0.86 [0.56, 1.32]
3.2 Point abstinence, longest follow-up	2	246	Risk Ratio (M-H, Fixed, 95% CI)	1.43 [1.00, 2.04]
3.3 Continuous abstinence, end of treatment	2	96	Risk Ratio (M-H, Random, 95% CI)	8.11 [1.62, 40.55]

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
3.4 Frequency of drug intake, end of treatment	1	176	Std. Mean Difference (IV, Fixed, 95% CI)	-0.67 [-0.97, -0.36]
3.5 Severity of dependence	1	70	Std. Mean Difference (IV, Random, 95% CI)	0.16 [-0.30, 0.63]

Analysis 3.1. Comparison 3: Contingency management (CM) reinforcement versus non-contingency management (non-CM) reinforcement, Outcome 1: Dropouts

Study or Subgroup	CM reinforcement Events	CM reinforcement Total	Non-CM reinforcement Events	Non-CM reinforcement Total	Weight	Risk Ratio M-H, Random, 95% CI
Higgins 2000	16	36	16	34	17.7%	0.94 [0.57 , 1.57]
Landovitz 2015	14	70	44	100	17.6%	0.45 [0.27 , 0.76]
McDonell 2013	53	91	30	85	20.6%	1.65 [1.18 , 2.31]
Poling 2006	22	52	22	54	18.7%	1.04 [0.66 , 1.63]
Schottenfeld 2011	27	73	41	72	20.2%	0.65 [0.45 , 0.93]
Silverman 1996	2	19	3	18	5.2%	0.63 [0.12 , 3.35]
Total (95% CI)		**341**		**363**	**100.0%**	**0.86 [0.56 , 1.32]**
Total events:	134		156			

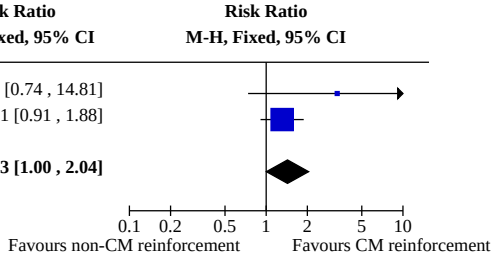
Heterogeneity: Tau² = 0.20; Chi² = 22.92, df = 5 (P = 0.0004); I² = 78%
Test for overall effect: Z = 0.68 (P = 0.50)
Test for subgroup differences: Not applicable



Analysis 3.2. Comparison 3: Contingency management (CM) reinforcement versus non-contingency management (non-CM) reinforcement, Outcome 2: Point abstinence, longest follow-up

Study or Subgroup	CM reinforcement Events	CM reinforcement Total	Non-CM reinforcement Events	Non-CM reinforcement Total	Weight	Risk Ratio M-H, Fixed, 95% CI
Higgins 2000	7	36	2	34	6.2%	3.31 [0.74 , 14.81]
McDonell 2013	42	91	30	85	93.8%	1.31 [0.91 , 1.88]
Total (95% CI)		**127**		**119**	**100.0%**	**1.43 [1.00 , 2.04]**
Total events:	49		32			

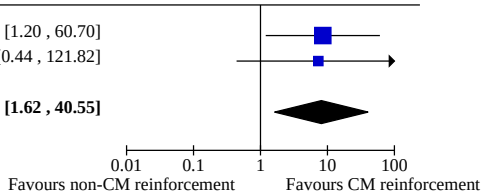
Heterogeneity: Chi² = 1.43, df = 1 (P = 0.23); I² = 30%
Test for overall effect: Z = 1.98 (P = 0.05)
Test for subgroup differences: Not applicable



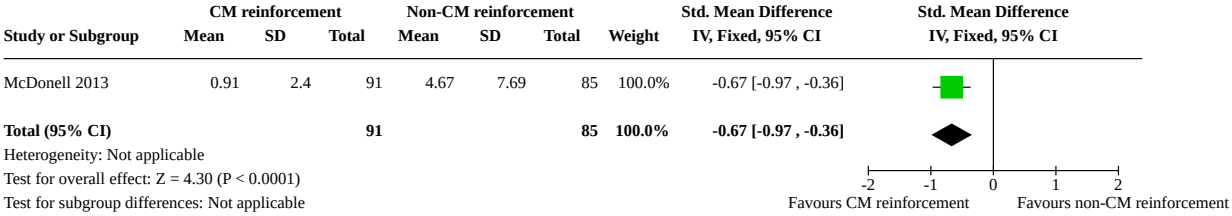
Analysis 3.3. Comparison 3: Contingency management (CM) reinforcement versus non-contingency management (non-CM) reinforcement, Outcome 3: Continuous abstinence, end of treatment

Study or Subgroup	CM reinforcement Events	CM reinforcement Total	Non-CM reinforcement Events	Non-CM reinforcement Total	Weight	Risk Ratio M-H, Random, 95% CI
Silverman 1996	9	19	1	18	67.2%	8.53 [1.20 , 60.70]
Silverman 1998	7	40	0	19	32.8%	7.32 [0.44 , 121.82]
Total (95% CI)		**59**		**37**	**100.0%**	**8.11 [1.62 , 40.55]**
Total events:	16		1			

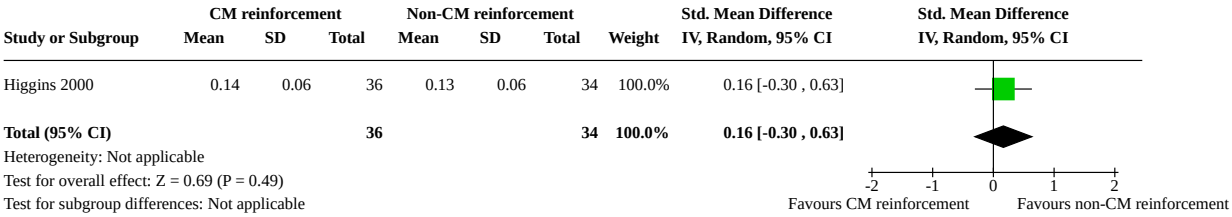
Heterogeneity: Tau² = 0.00; Chi² = 0.01, df = 1 (P = 0.93); I² = 0%
Test for overall effect: Z = 2.55 (P = 0.01)
Test for subgroup differences: Not applicable



Analysis 3.4. Comparison 3: Contingency management (CM) reinforcement versus non-contingency management (non-CM) reinforcement, Outcome 4: Frequency of drug intake, end of treatment



Analysis 3.5. Comparison 3: Contingency management (CM) reinforcement versus non-contingency management (non-CM) reinforcement, Outcome 5: Severity of dependence



Comparison 4. Cognitive behavioural therapy (CBT) versus other psychosocial interventions

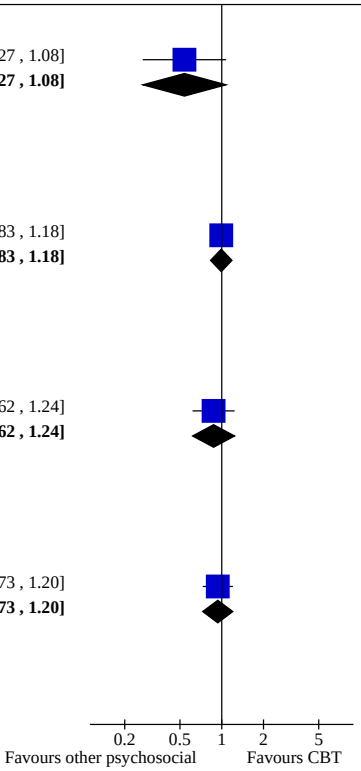
Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
4.1 Dropouts	4		Risk Ratio (M-H, Random, 95% CI)	Subtotals only
4.1.1 Interpersonal therapy	1	42	Risk Ratio (M-H, Random, 95% CI)	0.54 [0.27, 1.08]
4.1.2 Psychodynamic therapy	1	243	Risk Ratio (M-H, Random, 95% CI)	0.99 [0.83, 1.18]
4.1.3 12-step facilitation	1	145	Risk Ratio (M-H, Random, 95% CI)	0.87 [0.62, 1.24]
4.1.4 Acceptance and commitment therapy	1	104	Risk Ratio (M-H, Random, 95% CI)	0.94 [0.73, 1.20]
4.2 Point abstinence, end of treatment	4		Risk Ratio (M-H, Random, 95% CI)	Subtotals only
4.2.1 Interpersonal therapy	1	42	Risk Ratio (M-H, Random, 95% CI)	1.71 [0.84, 3.48]
4.2.2 Psychodynamic therapy	1	243	Risk Ratio (M-H, Random, 95% CI)	0.87 [0.66, 1.15]
4.2.3 Contingency management	1	55	Risk Ratio (M-H, Random, 95% CI)	0.66 [0.38, 1.16]
4.2.4 Acceptance and commitment therapy	1	26	Risk Ratio (M-H, Random, 95% CI)	1.29 [0.47, 3.51]
4.3 Point abstinence, longest follow-up	3		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
4.3.1 Psychodynamic therapy	1	243	Risk Ratio (M-H, Fixed, 95% CI)	1.04 [0.82, 1.32]
4.3.2 Contingency management	1	55	Risk Ratio (M-H, Fixed, 95% CI)	1.17 [0.73, 1.87]
4.3.3 Acceptance and commitment therapy	1	19	Risk Ratio (M-H, Fixed, 95% CI)	0.73 [0.26, 2.07]
4.4 Continuous abstinence, end of treatment	3		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
4.4.1 Interpersonal therapy	1	42	Risk Ratio (M-H, Fixed, 95% CI)	2.25 [0.82, 6.18]
4.4.2 12-step facilitation	2	225	Risk Ratio (M-H, Fixed, 95% CI)	1.23 [0.89, 1.70]
4.5 Continuous abstinence, longest follow-up	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
4.5.1 12-step facilitation	1	51	Risk Ratio (M-H, Fixed, 95% CI)	1.97 [1.00, 3.86]
4.6 Frequency of drug intake, end of treatment	1		Std. Mean Difference (IV, Fixed, 95% CI)	Subtotals only
4.6.1 Contingency management	1	82	Std. Mean Difference (IV, Fixed, 95% CI)	-0.09 [-0.53, 0.34]
4.7 Longest period of abstinence	1		Std. Mean Difference (IV, Fixed, 95% CI)	Subtotals only
4.8 Severity of dependence	1		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
4.8.2 Acceptance and commitment therapy	1	104	Std. Mean Difference (IV, Random, 95% CI)	-0.02 [-0.40, 0.37]
4.9 Depression	1	104	Std. Mean Difference (IV, Random, 95% CI)	0.18 [-0.21, 0.56]
4.9.1 Acceptance and commitment therapy	1	104	Std. Mean Difference (IV, Random, 95% CI)	0.18 [-0.21, 0.56]

Analysis 4.1. Comparison 4: Cognitive behavioural therapy (CBT) versus other psychosocial interventions, Outcome 1: Dropouts

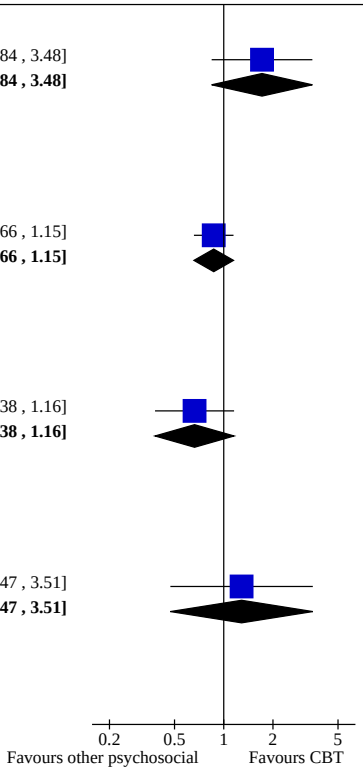
Study or Subgroup	CBT Events	CBT Total	Other psychosocial intervention Events	Other psychosocial intervention Total	Weight	Risk Ratio M-H, Random, 95% CI
4.1.1 Interpersonal therapy						
Carroll 1991	7	21	13	21	100.0%	0.54 [0.27 , 1.08]
Subtotal (95% CI)		**21**		**21**	**100.0%**	**0.54 [0.27 , 1.08]**
Total events:	7		13			
Heterogeneity: Not applicable						
Test for overall effect: Z = 1.75 (P = 0.08)						
4.1.2 Psychodynamic therapy						
Crits-Christoph 1999 arm 1	79	119	83	124	100.0%	0.99 [0.83 , 1.18]
Subtotal (95% CI)		**119**		**124**	**100.0%**	**0.99 [0.83 , 1.18]**
Total events:	79		83			
Heterogeneity: Not applicable						
Test for overall effect: Z = 0.09 (P = 0.93)						
4.1.3 12-step facilitation						
Schottenfeld 2011	31	71	37	74	100.0%	0.87 [0.62 , 1.24]
Subtotal (95% CI)		**71**		**74**	**100.0%**	**0.87 [0.62 , 1.24]**
Total events:	31		37			
Heterogeneity: Not applicable						
Test for overall effect: Z = 0.76 (P = 0.45)						
4.1.4 Acceptance and commitment therapy						
Smout 2010	36	53	37	51	100.0%	0.94 [0.73 , 1.20]
Subtotal (95% CI)		**53**		**51**	**100.0%**	**0.94 [0.73 , 1.20]**
Total events:	36		37			
Heterogeneity: Not applicable						
Test for overall effect: Z = 0.52 (P = 0.61)						

Test for subgroup differences: $Chi^2 = 3.01$, df = 3 (P = 0.39), $I^2 = 0.4\%$



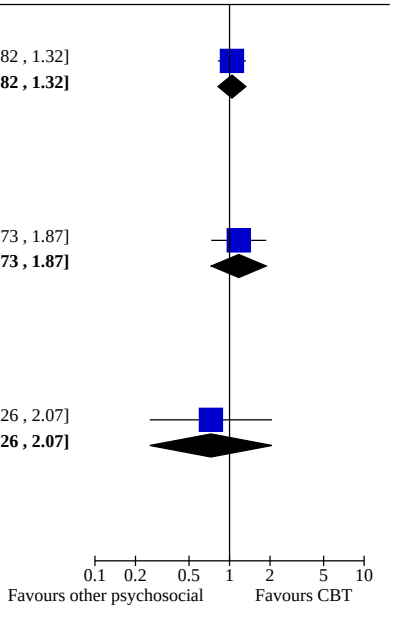
Analysis 4.2. Comparison 4: Cognitive behavioural therapy (CBT) versus other psychosocial interventions, Outcome 2: Point abstinence, end of treatment

Study or Subgroup	CBT Events	CBT Total	Other psychosocial intervention Events	Other psychosocial intervention Total	Weight	Risk Ratio M-H, Random, 95% CI
4.2.1 Interpersonal therapy						
Carroll 1991	12	21	7	21	100.0%	1.71 [0.84 , 3.48]
Subtotal (95% CI)		**21**		**21**	**100.0%**	**1.71 [0.84 , 3.48]**
Total events:	12		7			
Heterogeneity: Not applicable						
Test for overall effect: Z = 1.49 (P = 0.14)						
4.2.2 Psychodynamic therapy						
Crits-Christoph 1999 arm 1	50	119	60	124	100.0%	0.87 [0.66 , 1.15]
Subtotal (95% CI)		**119**		**124**	**100.0%**	**0.87 [0.66 , 1.15]**
Total events:	50		60			
Heterogeneity: Not applicable						
Test for overall effect: Z = 0.99 (P = 0.32)						
4.2.3 Contingency management						
Rawson 2002 arm 4	11	28	16	27	100.0%	0.66 [0.38 , 1.16]
Subtotal (95% CI)		**28**		**27**	**100.0%**	**0.66 [0.38 , 1.16]**
Total events:	11		16			
Heterogeneity: Not applicable						
Test for overall effect: Z = 1.45 (P = 0.15)						
4.2.4 Acceptance and commitment therapy						
Smout 2010	6	14	4	12	100.0%	1.29 [0.47 , 3.51]
Subtotal (95% CI)		**14**		**12**	**100.0%**	**1.29 [0.47 , 3.51]**
Total events:	6		4			
Heterogeneity: Not applicable						
Test for overall effect: Z = 0.49 (P = 0.62)						
Test for subgroup differences: Chi² = 4.87, df = 3 (P = 0.18), I² = 38.4%						



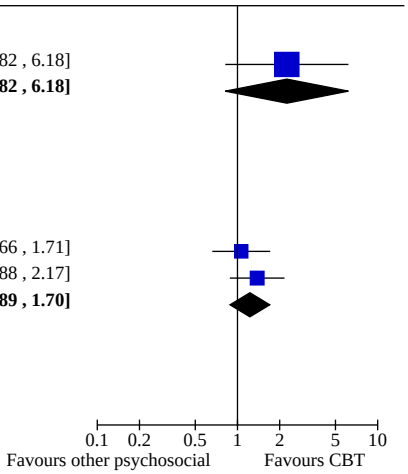
Analysis 4.3. Comparison 4: Cognitive behavioural therapy (CBT) versus other psychosocial interventions, Outcome 3: Point abstinence, longest follow-up

Study or Subgroup	CBT Events	CBT Total	Other psychosocial intervention Events	Other psychosocial intervention Total	Weight	Risk Ratio M-H, Fixed, 95% CI
4.3.1 Psychodynamic therapy						
Crits-Christoph 1999 arm 1	64	119	64	124	100.0%	1.04 [0.82 , 1.32]
Subtotal (95% CI)		**119**		**124**	**100.0%**	**1.04 [0.82 , 1.32]**
Total events:	64		64			
Heterogeneity: Not applicable						
Test for overall effect: Z = 0.34 (P = 0.73)						
4.3.2 Contingency management						
Rawson 2002 arm 4	17	28	14	27	100.0%	1.17 [0.73 , 1.87]
Subtotal (95% CI)		**28**		**27**	**100.0%**	**1.17 [0.73 , 1.87]**
Total events:	17		14			
Heterogeneity: Not applicable						
Test for overall effect: Z = 0.66 (P = 0.51)						
4.3.3 Acceptance and commitment therapy						
Smout 2010	4	11	4	8	100.0%	0.73 [0.26 , 2.07]
Subtotal (95% CI)		**11**		**8**	**100.0%**	**0.73 [0.26 , 2.07]**
Total events:	4		4			
Heterogeneity: Not applicable						
Test for overall effect: Z = 0.60 (P = 0.55)						
Test for subgroup differences: Chi² = 0.69, df = 2 (P = 0.71), I² = 0%						



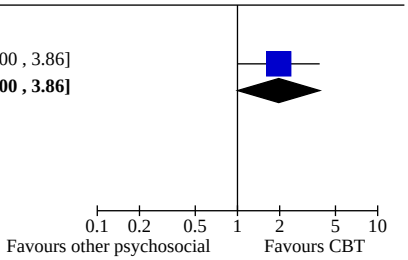
Analysis 4.4. Comparison 4: Cognitive behavioural therapy (CBT) versus other psychosocial interventions, Outcome 4: Continuous abstinence, end of treatment

Study or Subgroup	CBT Events	CBT Total	Other psychosocial interventions Events	Other psychosocial interventions Total	Weight	Risk Ratio M-H, Fixed, 95% CI
4.4.1 Interpersonal therapy						
Carroll 1991	9	21	4	21	100.0%	2.25 [0.82 , 6.18]
Subtotal (95% CI)		**21**		**21**	**100.0%**	**2.25 [0.82 , 6.18]**
Total events:	9		4			
Heterogeneity: Not applicable						
Test for overall effect: Z = 1.57 (P = 0.12)						
4.4.2 12-step facilitation						
Carroll 1998	20	47	20	50	48.9%	1.06 [0.66 , 1.71]
Maude-Griffin 1998	26	59	22	69	51.1%	1.38 [0.88 , 2.17]
Subtotal (95% CI)		**106**		**119**	**100.0%**	**1.23 [0.89 , 1.70]**
Total events:	46		42			
Heterogeneity: $Chi^2 = 0.62$, df = 1 (P = 0.43); $I^2 = 0\%$						
Test for overall effect: Z = 1.23 (P = 0.22)						
Test for subgroup differences: $Chi^2 = 1.25$, df = 1 (P = 0.26), $I^2 = 20.3\%$						



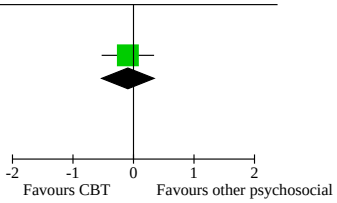
Analysis 4.5. Comparison 4: Cognitive behavioural therapy (CBT) versus other psychosocial interventions, Outcome 5: Continuous abstinence, longest follow-up

Study or Subgroup	CBT Events	CBT Total	Other psychosocial interventions Events	Other psychosocial interventions Total	Weight	Risk Ratio M-H, Fixed, 95% CI
4.5.1 12-step facilitation						
Carroll 1998	14	24	8	27	100.0%	1.97 [1.00 , 3.86]
Subtotal (95% CI)		**24**		**27**	**100.0%**	**1.97 [1.00 , 3.86]**
Total events:	14		8			
Heterogeneity: Not applicable						
Test for overall effect: Z = 1.97 (P = 0.05)						
Test for subgroup differences: Not applicable						

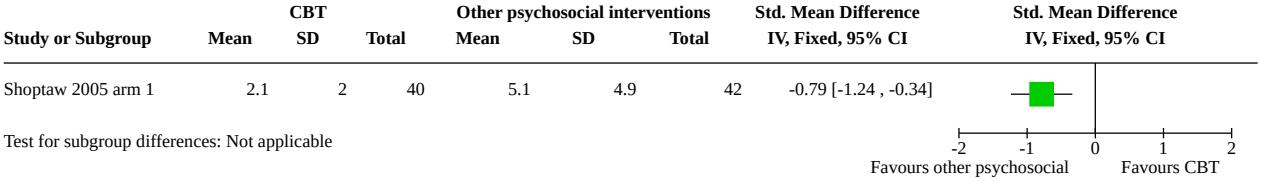


Analysis 4.6. Comparison 4: Cognitive behavioural therapy (CBT) versus other psychosocial interventions, Outcome 6: Frequency of drug intake, end of treatment

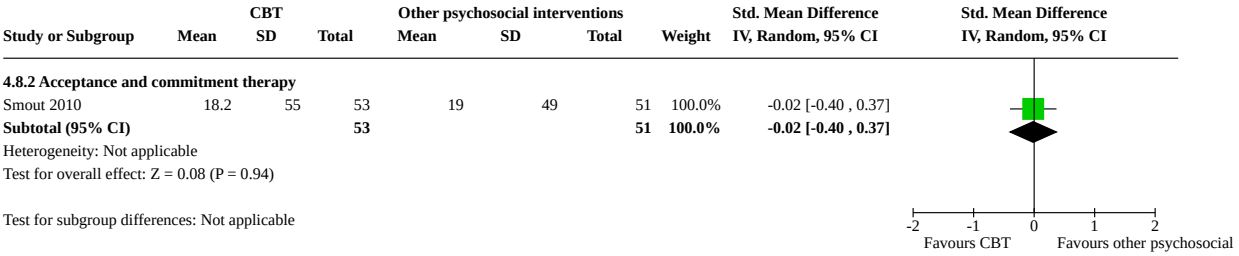
Study or Subgroup	CBT Mean	CBT SD	CBT Total	Other psychosocial intervention Mean	Other psychosocial intervention SD	Other psychosocial intervention Total	Weight	Std. Mean Difference IV, Fixed, 95% CI
4.6.1 Contingency management								
Shoptaw 2005 arm 1	2.2	6	40	2.7	4.6	42	100.0%	-0.09 [-0.53 , 0.34]
Subtotal (95% CI)			**40**			**42**	**100.0%**	**-0.09 [-0.53 , 0.34]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.42 (P = 0.67)								
Test for subgroup differences: Not applicable								



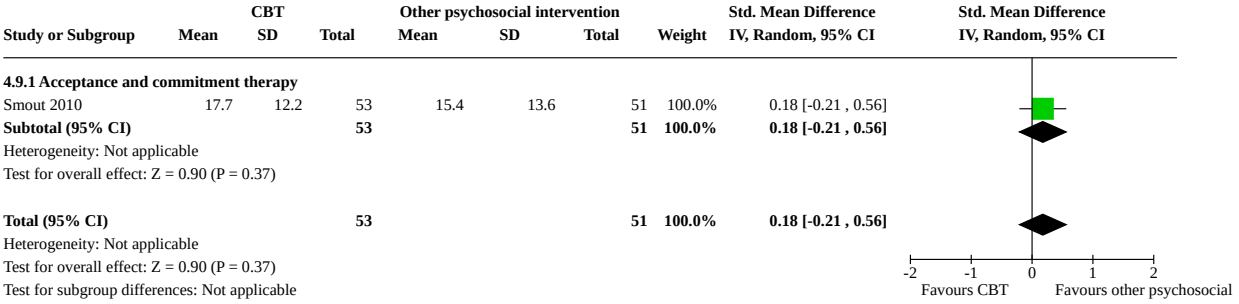
Analysis 4.7. Comparison 4: Cognitive behavioural therapy (CBT) versus other psychosocial interventions, Outcome 7: Longest period of abstinence



Analysis 4.8. Comparison 4: Cognitive behavioural therapy (CBT) versus other psychosocial interventions, Outcome 8: Severity of dependence



Analysis 4.9. Comparison 4: Cognitive behavioural therapy (CBT) versus other psychosocial interventions, Outcome 9: Depression



APPENDICES

Appendix 1. Cochrane Drug and Alcohol Group Specialised Register search strategy

CDAG Specialised register (via CRSLive)

from 2015 to 26 September 2023 (43 hits)

#1 (amphetamine* OR cocaine OR diethylpropion OR ephedrine OR methylphenidate OR pemoline OR phenmetrazine OR phendimetrazine OR phenylpropanolamine OR phenilpropanolamine OR psychostimulant*):ti,xdi AND INREGISTER

#2 (counsel* OR psychoeducat* OR educat*):ti,ab,xin AND INREGISTER

#3 (psychological NEAR2 (therap* OR treatment*)):ti,ab,xin AND INREGISTER

#4 ((social OR peer OR group) NEAR2 support) OR (self NEXT help) OR (cognitive NEAR2 (therap* OR behav*)):ti,ab,xin AND REGISTER

#5 CBT:ti,xin AND INREGISTER

#6 (mindfulness OR relax* OR (family OR couple) NEAR2 therap*):ti,ab,xin AND INREGISTER

#7 "Contingency Management" AND INREGISTER

#8 CM:ti,ab,xin AND INREGISTER

#9 incentive* OR voucher OR psychotherap* OR psychosocial* OR reinforcement OR motivation* OR contingent* OR advice AND INREGISTER

#10 #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9

#11 #1 AND #10

#12 >2014:YR AND INREGISTER

#13 #11 AND #12

Appendix 2. CENTRAL search strategy

CENTRAL (via onlinelibrary.wiley.com)

Cochrane Library issue 9, 2023 (468 hits)

1. MeSH descriptor: [Substance-Related Disorders] explode all trees
2. ((psychostimulant* or polydrug* or drug* or substance) near/3 (abuse* or abusing or depend* or addict* or disorder*)):ti,ab
3. #1 or #2
4. MeSH descriptor: [Psychotherapy] explode all trees
5. psychotherap* or psychosocial or voucher or reinforcement or motivation* or contingent* or biofeedback or community or stimulation or education* or counsel*:ti,ab,kw
6. (social near/2 skill*):ti,ab
7. (coping near/2 skill):ti,ab
8. MeSH descriptor: [Counseling] explode all trees
9. (behavi* near/2 therap*):ti,ab
10. MeSH descriptor: [Reinforcement (Psychology)] explode all trees
11. (brief near intervention):ti,ab
12. (early near intervention):ti,ab
13. (minimal near intervention):ti,ab
14. (cognitive near therapy):ti,ab
15. (family near therapy):ti,ab
16. (stress near management near training):ti,ab
17. (supportive near expressive near therapy):ti,ab
18. MeSH descriptor: [Social Support] explode all trees
19. MeSH descriptor: [Case Management] explode all trees
20. (self near control near training):ti,ab
21. neurobehavioral*:ab,ti
22. #4 or #5 or #6 or #7 or #8 or #9 or #10 or #11 or #12 or #13 or #14 or #15 or #16 or #17 or #18 or #19 or #20 or #21
23. amphetamine:ti,ab,kw (Word variations have been searched)
24. diethylpropion:ti,ab,kw (Word variations have been searched)
25. methylphenidate:ti,ab,kw (Word variations have been searched)
26. pemoline:ti,ab,kw (Word variations have been searched)
27. phenmetrazine:ti,ab,kw (Word variations have been searched)
28. phendimetrazine:ti,ab,kw (Word variations have been searched)
29. phenylpropanolamine:ti,ab,kw (Word variations have been searched)
30. Phenylpropanolamine:ti,ab,kw (Word variations have been searched)
31. ephedrine:ti,ab,kw (Word variations have been searched)
32. cocaine:ti,ab,kw (Word variations have been searched)
33. #23 or #24 or #25 or #26 or #27 or #28 or #29 or #30 or #31 or #32
34. #3 and #22 and #33 with Publication Year from 2015 to present, in Trials

Appendix 3. MEDLINE search strategy

Ovid MEDLINE

From 2015 to 26 September 2023 (580 hits)

1. ((stimulant* or psychostimulant* or psycho-stimulant*) adj5 (abstain* or abstinence or abstinent or abuse* or addict* or chronic* or detox* or disorder* or depend* or habitual* or misuse* or overuse or reduce* or reducing or reduction or retain* or retention or users or withdrawal)).tw,hw,id.
2. Cocaine-Related Disorders/ or ((cocaine* or crack-cocaine*) adj5 (abuse* or addict* or chronic* or disorder* or depend* or habitual* or misuse* or overuse or users)).tw,kf.
3. Amphetamine-Related Disorders/ or (methamphetamine* adj5 (abuse* or addict* or chronic* or disorder* or depend* or habitual* or misuse* or overuse or users)).tw,kf.
4. 1 or 2 or 3
5. ((drug or polydrug* or substance or stimulant* or psychostimulant* or psycho-stimulant*) and (abuse* or addict* or disorder* or depend* or misuse* or overuse or users)).tw,kf.
6. substance-related disorders/ or drug overdose/ or substance abuse, intravenous/ or substance withdrawal syndrome/
7. 5 or 6
8. Amphetamine/ or Diethylpropion/ or Methylphenidate/ or Pemoline/ or Phenmetrazine/ or Phenylpropanolamine/ or Ephedrine/ or Cocaine/ or Crack Cocaine/ or (amphetamine* or diethylpropion*or methylphenidate or methilphenidate or pemoline or phenmetrazine or phendimetrazine or phenilpropanolamine or phenylpropanolamine or ephedrine or cocaine or crack).tw.
9. 7 and 8
10. 4 or 9
11. exp Psychotherapy/
12. (psychotherap* or psychosocial or voucher or reinforcement or motivation* or contingent* or biofeedback or community or stimulation or education* or counsel*).tw.
13. (social adj2 skill*).tw.
14. (coping adj2 skill).tw.
15. exp Counseling/
16. (behavi* adj2 therap*).tw.
17. exp Reinforcement, Psychology/
18. ((brief or minimal or early or motivat$) adj3 (intervention$ or therap$ or interview$ or advice)).tw.
19. (cognitive adj3 therapy).tw.
20. (family adj2 therapy).tw.
21. stress management training.tw.
22. supportive expressive therapy.tw.
23. exp Social Support/
24. exp Case Management/
25. self control training.tw.
26. (behavio* adj2 (change or modification)).tw.
27. CBT.tw.
28. psychodynamic*.tw.
29. talking therap*.tw.
30. ((self adj2 help adj2 group$) or (twelve adj2 step) or 12-step).ti,ab.
31. or/11-30
32. 10 and 31
33. randomized controlled trial.pt.
34. controlled clinical trial.pt.
35. random*.ab.
36. placebo.ab.
37. clinical trials as topic.sh.
38. 39 random allocation.sh.
39. trial.ti.
40. 33 or 34 or 35 or 36 or 37 or 38 or 39
41. exp animals/ not humans.sh.

42.40 not 41
43.32 and 42
44.limit 43 to yr="2015 -Current"

Appendix 4. Embase search strategy

Ovid Embase

From 2015 to 26 September 2023 (1100 hits)

1. ((stimulant* or psychostimulant* or psycho-stimulant*) adj5 (abstain* or abstinence or abstinent or abuse* or addict* or chronic* or detox* or disorder* or depend* or habitual* or misuse* or overuse or reduce* or reducing or reduction or retain* or retention or users or withdrawal)).tw,kf.
2. cocaine dependence/ or ((cocaine* or crack-cocaine*) adj5 (abuse* or addict* or chronic* or disorder* or depend* or habitual* or misuse* or overuse or users)).tw,kf.
3. amphetamine dependence/ or (methamphetamine* adj5 (abuse* or addict* or chronic* or disorder* or depend* or habitual* or misuse* or overuse or users)).tw,kf.
4. 1 or 2 or 3
5. ((drug or polydrug* or substance or stimulant* or psychostimulant* or psycho-stimulant*) and (abuse* or addict* or disorder* or depend* or misuse* or overuse or users)).tw,kf.
6. drug dependence/ or amphetamine dependence/ or cocaine dependence/ or drug abuse pattern/ or drug craving/ or drug misuse/ or drug seeking behavior/ or methamphetamine dependence/ or multiple drug abuse/
7. 5 or 6
8. Amphetamine/ or Diethylpropion/ or Methylphenidate/ or Pemoline/ or Phenmetrazine/ or Phenylpropanolamine/ or Ephedrine/ or Cocaine/ or Crack Cocaine/ or (amphetamine* or diethylpropion*or methylphenidate or methilphenidate or pemoline or phenmetrazine or phendimetrazine or phenilpropanolamine or phenylpropanolamine or ephedrine or cocaine or crack).tw.
9. 7 and 8
10. 4 or 9
11. exp psychotherapy/
12. (psychotherap* or psychosocial or voucher or reinforcement or motivation* or contingent* or biofeedback or community or stimulation or education* or counsel*).tw.
13. (social adj2 skill*).tw.
14. (coping adj2 skill).tw.
15. exp counseling/
16. (behavi* adj2 therap*).tw.
17. exp "reinforcement (psychology)"/
18. ((brief or minimal or early or motivat$) adj3 (intervention$ or therap$ or interview$ or advice)).tw.
19. (cognitive adj3 therapy).tw.
20. (family adj2 therapy).tw.
21. stress management training.tw.
22. supportive expressive therapy.tw.
23. exp social support/
24. exp case management/
25. self control training.tw.
26. (behavio* adj2 (change or modification)).tw.
27. (behavio* adj2 (change or modification)).tw. (40445)
28. CBT.tw. (18921)
29. psychodynamic*.tw. (9606)
30. talking therap*.tw. (236)
31. ((self adj2 help adj2 group$) or (twelve adj2 step) or 12-step).ti,ab. (4122)
32. contingency management.mp. (1598)
33. financial incentives.mp. (5548)
34. 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33
35. 10 and 34
36. Clinical-Trial/ or Randomized-Controlled-Trial/ or Randomization/ or Single-Blind-Procedure/ or Double-Blind-Procedure/ or Crossover-Procedure/ or Prospective-Study/ or Placebo/

37. (((clinical or control or controlled) adj (study or trial)) or ((single or double or triple) adj (blind$3 or mask$3)) or (random$ adj (assign $ or allocat$ or group or grouped or patients or study or trial or distribut$)) or (crossover adj (design or study or trial)) or placebo or placebos).ti,ab.
38. 36 or 37
39. 35 and 38
40. limit 39 to yr="2015 -Current"

Appendix 5. CINAHL search strategy

CINAHL (via EBSCO HOST)

from 2015 to 26 September 2023 (354 hits)

1. (MH "Substance Use Disorders+")
2. TX(drug N3 addict*) or TX(drug N3 dependen*) or TX(drug N3 abuse*) or TX(drug N3 misus*)
3. TX(substance N3 addict*) or TX(substance N3 dependen*) or TX(substance N3 abuse*) or TX(substance N3 misus*)
4. TX(addict* OR overdos* OR intoxicat* OR abstin* OR abstain OR withdraw* OR abus* OR misus* OR disorder* OR dependen*)
5. TX(use* N2 drug) or TX(use* N2 disorder) or TX(use* N2 illicit)
6. S1 OR S2 OR S3 OR S4 OR S5
7. (MH "Amphetamines+")
8. TI amphetamine* OR AB amphetamine*
9. TI Diethylpropion OR AB Diethylpropion
10. (MH "Methylphenidate") OR TX methylphenidate OR TX methilphenidate
11. TX pemoline
12. TI Phenmetrazine OR AB Phenmetrazine
13. MH Phenylpropanolamine OR TI phenilpropanolamine OR AB phenilpropanolamine OR TI phenylpropanolamine OR AB phenylpropanolamine
14. TX Ephedrine
15. MH Cocaine OR TI Cocaine OR AB Cocaine
16. S7 OR S8 OR S9 OR S10 OR S11 OR S12 OR S13 OR S14 OR S15
17. S6 AND S16
18. TX((psychostimulant*) N3 (abuse* OR dependence* OR disorder* OR addict*))
19. S17 OR S18
20. (MM "Counseling")
21. (MH "Motivational Interviewing")
22. (MH "Psychotherapy+")
23. TI incentive* OR voucher OR psychotherap* OR psychosocial* OR reinforcement OR motivation* OR contingent* OR advice
24. AB incentive* OR voucher OR psychotherap* OR psychosocial* OR reinforcement OR motivation* OR contingent* OR advice
25. TI (contingency N1 management) OR AB (contingency N1 management)
26. TI (behaviour* N2 therapy) OR AB (behaviour* N2 therapy)
27. (MH "Reinforcement (Psychology)+")
28. TI(CBT or CM)
29. S20 OR S21 OR S22 OR S23 OR S24 OR S25 OR S26 OR S27 OR S28
30. MH "Clinical Trials+"
31. PT Clinical trial
32. TI clinic* N1 trial* or AB clinic* N1 trial*
33. TI (singl* or doubl* or trebl* or tripl*) and TI (blind* or mask*)
34. AB (singl* or doubl* or trebl* or tripl*) and AB (blind* or mask*)
35. TI randomi?ed control* trial* or AB randomi?ed control* trial*
36. MH "Random Assignment"
37. TI random* allocat* or AB random* allocat*
38. MH "Placebos"
39. TI placebo* or AB placebo*
40. MH "Quantitative Studies"
41. S30 OR S31 OR S32 OR S33 OR S34 OR S35 OR S36 OR S37 OR S38 OR S39 OR S40

42.S19 AND S29 AND S41

Appendix 6. Web of Science search strategy

WOS (via THOMSON REUTERS)

from 2015 to 26 September 2023 (293 hits)

((TS=(counsel* OR psychoeducat* OR educat* OR (psychological NEAR/2 (therap* OR treatment*)) OR psychotherap* OR psychosocial* OR psychoanalytic OR ((social OR peer OR group) NEAR/2 support) OR (self NEXT help) OR (cognitive NEAR/2 (therap* OR behav*)) OR mindfulness OR relax* OR ((family OR couple) NEAR/2 therap*))) AND TS=(((amphetamine* OR cocaine OR diethylpropion OR ephedrine OR methylphenidate OR pemoline OR phenmetrazine OR phenmetrazine OR phenylpropanolamine OR phenylpropanolamine OR psychostimulant*) NEAR/3 (abuse* OR depend* OR use* OR disorder* OR addict*)))) AND TS=(" clinical trial" OR "comparative study" OR "evaluation study" OR "controlled trial" OR "prospective stud" OR random* OR placebo* OR "single blind" OR "double blind") and 2023 or 2022 or 2021 or 2020 or 2019 or 2018 or 2017 or 2016 or 2015 (Publication Years)

Appendix 7. PsycINFO search strategy

APA PsycINFO

From 2015 to September Week 3 2023 (407 hits)

1. ((stimulant* or psychostimulant* or psycho-stimulant*) adj5 (abstain* or abstinence or abstinent or abuse* or addict* or chronic* or detox* or disorder* or depend* or habitual* or misuse* or overuse or reduce* or reducing or reduction or retain* or retention or users or withdrawal)).mp.
2. ((cocaine* or crack-cocaine*) adj5 (abuse* or addict* or chronic* or disorder* or depend* or habitual* or misuse* or overuse or users)).mp.
3. (methamphetamine* adj5 (abuse* or addict* or chronic* or disorder* or depend* or habitual* or misuse* or overuse or users)).mp.
4. 1 or 2 or 3
5. ((drug or polydrug* or substance or stimulant* or psychostimulant* or psycho-stimulant*) and (abuse* or addict* or disorder* or depend* or misuse* or overuse or users)).tw.
6. exp "substance use disorder"/ or addiction treatment/ or craving/ or drug addiction/ or drug seeking/ or "substance use treatment"/
7. 5 or 6
8. Amphetamine/ or Diethylpropion/ or Methylphenidate/ or Pemoline/ or Phenmetrazine/ or Phenylpropanolamine/ or Ephedrine/ or Cocaine/ or Crack Cocaine/ or (amphetamine* or diethylpropion*or methylphenidate or methilphenidate or pemoline or phenmetrazine or phendimetrazine or phenilpropanolamine or phenylpropanolamine or ephedrine or cocaine or crack).tw.
9. 7 and 8
10. 4 or 9
11. exp psychotherapy/
12. (psychotherap* or psychosocial or voucher or reinforcement or motivation* or contingent* or biofeedback or community or stimulation or education* or counsel*).tw.
13. (social adj2 skill*).tw.
14. (coping adj2 skill).tw.
15. exp counseling/
16. (behavi* adj2 therap*).tw.
17. exp Reinforcement/
18. (cognitive adj3 therapy).tw.
19. (family adj2 therapy).tw.
20. stress management training.tw.
21. supportive expressive therapy.tw.
22. exp Social Support/
23. exp Case Management/
24. self control training.tw.
25. (behavio* adj2 (change or modification)).tw.
26. (behavio* adj2 (change or modification)).tw.
27. CBT.tw.
28. psychodynamic*.tw.
29. talking therap*.tw.

30.((self adj2 help adj2 group$) or (twelve adj2 step) or 12-step).ti,ab.
31.contingency management.mp.
32.financial incentives.mp.
33.or/11-32
34.10 and 33
35.exp Clinical Trials/
36.(random* or (clinical adj3 trial*) or (reserch adj3 design*) or (evaluat adj3 stud*) or (prospective* adj3 stud*)).tw.
37.((singl* or doubl* or trebl* or tripl*) adj3 (blind* or mask*)).tw.
38.35 or 36 or 37
39.34 and 38
40.limit 39 to yr="2015 -Current"

Appendix 8. Clinical trials registers search strategy

Database: ClinicalTrials.gov

Search Date: 28 September 2023

55 Studies found for:

Condition or disease: amphetamine OR methamphetamine OR cocaine OR psychostimulant

Intervention/treatment: "Cognitive Behavioral Therapy" OR CBT OR “cognitive therapy” OR reinforcement OR “coping skills” OR “relapse prevention” OR Contingency OR CM OR motivational OR MI OR "Interpersonal therapy approach" OR psychodynamic OR “supportive expressive” OR “self help” OR “twelve-steps” OR “12-steps”

Other terms: randomized

First posted on or after 01/01/2015

Database: WHO International Clinical Trials Registry Platform (ICTRP)

Search Date: 28 September 2023

Date registration from 2015

69 Studies found for:

amphetamine AND Cognitive Behavioral Therapy OR amphetamine AND CBT OR amphetamine AND cognitive therapy OR amphetamine AND reinforcement OR amphetamine AND coping skills OR amphetamine AND relapse prevention OR amphetamine AND Contingency OR amphetamine AND CM OR amphetamine AND motivational OR amphetamine AND MI OR amphetamine AND Interpersonal therapy approach OR amphetamine AND psychodynamic OR amphetamine AND supportive expressive OR amphetamine AND self help OR amphetamine AND twelve-steps OR amphetamine AND 12-steps OR methamphetamine AND Cognitive Behavioral Therapy OR methamphetamine AND CBT OR methamphetamine AND cognitive therapy OR methamphetamine AND reinforcement OR methamphetamine AND coping skills OR methamphetamine AND relapse prevention OR methamphetamine AND Contingency OR methamphetamine AND CM OR methamphetamine AND motivational OR methamphetamine AND MI OR methamphetamine AND Interpersonal therapy approach OR methamphetamine AND psychodynamic OR methamphetamine AND supportive expressive OR methamphetamine AND self help OR methamphetamine AND twelve-steps OR methamphetamine AND 12-steps OR cocaine AND Cognitive Behavioral Therapy OR cocaine AND CBT OR cocaine AND cognitive therapy OR cocaine AND reinforcement OR cocaine AND coping skills OR cocaine AND relapse prevention OR cocaine AND Contingency OR cocaine AND CM OR cocaine AND motivational OR cocaine AND MI OR cocaine AND Interpersonal therapy approach OR cocaine AND psychodynamic OR cocaine AND supportive expressive OR cocaine AND self help OR cocaine AND twelve-steps OR cocaine AND 12-steps OR psychostimulant AND Cognitive Behavioral Therapy OR psychostimulant AND CBT OR psychostimulant AND cognitive therapy OR psychostimulant AND reinforcement OR psychostimulant AND coping skills OR psychostimulant AND relapse prevention OR psychostimulant AND Contingency OR psychostimulant AND CM OR psychostimulant AND motivational OR psychostimulant AND MI OR psychostimulant AND Interpersonal therapy approach OR psychostimulant AND psychodynamic OR psychostimulant AND supportive expressive OR psychostimulant AND self help OR psychostimulant AND twelve-steps OR psychostimulant AND 12-steps

Appendix 9. 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 enroling 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 enroling participants could possibly foresee assignments because one of the following method was used: open random allocation schedule (e.g. a list of random numbers); assignment envelopes without appropriate safeguards (e.g. if envelopes were unsealed or non-opaque or not sequentially numbered); alternation or rotation; date of birth; case record number; any other explicitly unconcealed procedure
	Unclear risk	Insufficient information to permit judgement of low or high risk. This is usually the case if the method of concealment is not described or not described in sufficient detail to allow a definite judgement.
3. Blinding of participants and providers (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is not likely to be influenced by lack of blinding. Blinding of participants and key study personnel ensured, and unlikely that the blinding could have been broken
	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
4. Blinding of participants and providers (performance bias) Subjective outcomes	Low risk	Blinding of participants and providers ensured 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

(Continued)

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
	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
6. Blinding of outcome assessor (detection bias) Subjective outcomes	Low risk	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 dropout	Low risk	No missing outcome data Reasons for missing outcome data unlikely to be related to true outcome (for survival data, censoring unlikely to be introducing bias) Missing outcome data balanced in numbers across intervention groups, with similar reasons for missing data across groups For dichotomous outcome data, the proportion of missing outcomes compared with observed event risk not enough to have a clinically relevant impact on the intervention effect estimate For continuous outcome data, plausible effect size (difference in means or standardized difference in means) among missing outcomes not enough to have a clinically relevant impact on observed effect size Missing data have been imputed using appropriate methods All randomised patients are reported/analysed in the group they were allocated to by randomisation irrespective of non-compliance and co-interventions (intention-to-treat)
	High risk	Reason for missing outcome data likely to be related to true outcome, with either imbalance in numbers or reasons for missing data across intervention groups For dichotomous outcome data, the proportion of missing outcomes compared with observed event risk enough to induce clinically relevant bias in intervention effect estimate For continuous outcome data, plausible effect size (difference in means or standardized difference in means) among missing outcomes enough to induce clinically relevant bias in observed effect size

(Continued)

		'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 dropouts not reported for each group)
8. Selective reporting (reporting bias)	Low risk	The study protocol is available and all the study's pre-specified (primary and secondary) outcomes that are of interest in the review have been reported in the pre-specified way The study protocol is not available but it is clear that the published reports include all expected outcomes, including those that were pre-specified (convincing text of this nature may be uncommon)
	High risk	Not all of the study's pre-specified primary outcomes have been reported One or more primary outcomes is reported using measurements, analysis methods or subsets of the data (e.g. subscales) that were not pre-specified One or more reported primary outcomes were not pre-specified (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

WHAT'S NEW

Date	Event	Description
15 February 2024	New search has been performed	Search updated, conclusions not changed
15 February 2024	New citation required but conclusions have not changed	New authors. Conclusions have not changed.

HISTORY

Protocol first published: Issue 11, 2015
Review first published: Issue 9, 2016

CONTRIBUTIONS OF AUTHORS

Minozzi, Saulle, and Agabio screened abstracts and full texts for inclusion.

Minozzi, Saulle, Agabio, and Traccis extracted data; Minozzi, Traccis, and Saulle assessed risk of bias of the included studies. Minozzi and Agabio performed the meta-analysis and wrote the results.

Minozzi, Agabio, and Saulle assessed the certainty of the evidence.

Agabio and Minozzi update the background.

Minozzi and Amato wrote the discussion and the conclusions.

All review authors contributed to writing the discussion and conclusion sections and revised the final report.

DECLARATIONS OF INTEREST

Silvia Minozzi: is the Joint-Coordinating Editor of Cochrane Drugs and Alcohol Group. She was not involved in the editorial process of the present review.

Rosella Saulle: none known.

Laura Amato: is an editor of Cochrane Drugs and Alcohol Group. She was not involved in the editorial process of the present review.

Roberta Agabio: is an editor of Cochrane Drugs and Alcohol Group. She was not involved in the editorial process of the present review.

Francesco Traccis: none known

SOURCES OF SUPPORT

Internal sources

- Department of Epidemiology, Lazio Regional Health Service, ASL Rome 1, Italy

  source of support

External sources

- No sources of support provided

DIFFERENCES BETWEEN PROTOCOL AND REVIEW

Title. The title of the previous version of the review was "Psychosocial interventions for psychostimulant misuse". We changed the title to "Psychosocial interventions for stimulant use disorder" to adopt current non-stigmatising language conventions. We used the term "stimulant use disorder" throughout the review text instead of "misuse" or "abuse".

Measures of treatment effect. We measured point abstinence and continuous abstinence at two different times: at the end of treatment and at the longest available follow-up after the end of treatment. We combined self-reported measures and measures assessed by urine analyses as the studies very often did not provide separate results for self-reported results and results verified by urine analysis results.

Risk of bias. For the domain "selective reporting of the results", in the previous version, we judged a study at low risk of bias if all the outcomes listed in the methods section of the studies were also reported in the results section. In this update, we searched for protocols of all the included studies; we judged a study at unclear risk of bias if the protocol was unavailable, and at low risk of bias if all the outcomes listed in the protocol were also reported in the results section of the study.

Data synthesis. In the previous version of the review, we analysed continuous outcomes by calculating the mean difference (MD) with 95% CI when the studies used the same instrument for assessing the outcome. We used the standardised mean difference (SMD) when the studies used different instruments. In this update, as the studies used different instruments or ways to measure continuous outcomes, we used SMDs for all the continuous outcomes, as well as for the very few comparisons where only one study was included, to increase the comparability of outcomes across comparisons.

Unit of analysis issues. For multi-arm studies that compared different treatments with the same control group, we divided the number of events and the number of participants of the control group by the number of experimental arms to avoid double-counting participants in the control groups when different arms of the same study were included in the same meta-analysis.

We added a sentence explaining that we analysed cluster-randomised studies according to guidance in the *Cochrane Handbook for Systematic Reviews of Interventions* (Higgins 2023). If results did not control for clustering, we imputed the intracluster correlation coefficient (ICC) from similar studies. We divided the effective sample size of each arm by the "design effect" quantity (1+(M-1) x ICC), where M is the average cluster size. However, as the Mitcheson 2007 study did not report the number of clusters and their size, we could not adjust the data for the design effect, and we excluded the study from meta-analyses. This was reported in the results section.

Subgroup analyses. In the previous version of the review, we performed subgroup analyses for studies including more than 30% of participants with opiate dependence or in methadone treatment. In this update, we performed subgroup analyses for the primary outcomes reported by at least 10 studies. We created three subgroups: all participants with comorbid opiate dependence and in methadone treatment; variable percentages of participants with comorbid opiate dependence and in methadone treatment; no participants with opiate dependence and in methadone treatment.

In the previous version of the review, we planned to divide studies into two groups: studies with low-complexity TAU (counselling, case management, clinical management) and studies with high-complexity TAU (cognitive behavioural therapy, contingency management, interpersonal therapy, psychodynamic therapy, 12- step facilitation), and to perform subgroup analyses to assess the effect of adding on another psychosocial intervention to low-complexity TAU or high-complexity TAU. We did not perform this analysis in the previous version because we didn't find important differences in TAU complexity in the included studies. For this update, we did not plan to undertake this subgroup analysis.

INDEX TERMS

Medical Subject Headings (MeSH)

*Cognitive Behavioral Therapy [methods]; Counseling; *Motivational Interviewing [methods]; Psychosocial Intervention; *Substance-Related Disorders [therapy]

MeSH check words

Adult; Humans