

ARTICLE

Drug and alcohol addiction: do psychosocial treatments work?

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SUMMARY

Methodological issues such as social desirability bias, subjective outcome measures, therapist enthusiasm and fidelity to the intervention remain a major problem in assessing the effectiveness of psychosocial treatments for substance misuse. Alcoholics Anonymous and other 12-step programmes are still widely used, although it is difficult to formally assess their effectiveness. Motivational interviewing is perhaps the most commonly used professional psychosocial treatment for substance misuse, but brief interventions based on this technique report a disappointing effect size (~0.2). Contingency management is perhaps the most effective reported modality, although it remains politically controversial. Cognitive-behavioural therapy and community reinforcement have been widely studied, but the results are often disappointing (effect sizes seldom exceed 0.5, despite very large trials). Residential rehabilitation remains an established treatment, but patient selection prevents formal cost-effectiveness studies.

LEARNING OBJECTIVES

- Recognise the difficulty of conducting and appraising research on psychosocial interventions
- Be aware of the most common psychosocial interventions
- Understand the modest differences between different psychosocial treatments, especially as reported from large trials such as Project MATCH, UKATT, COMBINE and SIPS

DECLARATION OF INTEREST

None

This is the last of three articles updating my overview of what works for addiction published almost 10 years ago in this journal (Luty 2003, 2006). The first two articles considered new challenges for substance misuse services and recent developments in pharmacotherapy (Luty 2014, 2015). This article considers psychosocial treatment – modifying an individual's substance use by talking and listening or changing their peer group and surroundings. Many guidelines and manuals for psychotherapy emphasise non-specific, therapist-dependent factors such as being

positive, empathetic, optimistic, supportive and enthusiastic (Miller 1999). Other non-specific 'interventions' include praising clients for attending counselling sessions. However, here I appraise the effects of the unique characteristics of each type of psychotherapy – those that distinguish them from other forms.

A note on effect sizes

Comparing the effectiveness of different forms of psychotherapy is fraught with problems. Effect sizes are often used in research (although these bring problems of their own to which I will return later) and I show them in this article. Conventionally, effect sizes are classified as small (0.2), medium (0.5) and large (0.8). The UK National Institute for Health and Care Excellence (NICE) has adopted an effect size of 0.5 as the threshold for clinical relevance (Ambresin 2014). Regrettably, many forms of psychotherapy fail to meet this threshold.

Overall effectiveness of substance misuse treatment

A meta-analysis of 78 US controlled studies of all forms of treatment for drug misuse conducted between 1965 and 1996 (Prendergast 2002) identified 58 that concerned non-pharmacological treatments. There were 8 trials of methadone maintenance and 8 of therapeutic communities. Just over half of the studies were randomised. The average study had 156 participants (median 81). The meta-analysis found a weighted mean effect size of $d=0.30$ and the following effect sizes for specific types of treatment: methadone maintenance 0.45; therapeutic community 0.25; and out-patient abstinence-based treatment 0.37. All the reports had a comparison group (typically, no treatment or treatment as usual). The effect size in this meta-analysis was taken from the first post-treatment assessment point or the point nearest the end of treatment. This is likely to overestimate treatment effects, which tend to decline with time, especially following intensive treatments such as residential rehabilitation. Outcome measures were a particular problem, as self-reported drug use and criminal behaviour are prone to significant under-reporting.

Dutra *et al* (2008) provide the most comprehensive review of psychosocial treatments for illicit drug use. They report on 34 controlled trials representing 2340 patients and including 5 trials for cannabis misuse and 9 for cocaine. Overall, a moderate effect size was obtained ($d=0.45$), with a mean intention-to-treat sample size of 38 (range 5–135). Around one-third of patients dropped out of the treatment groups before trial completion. The effectiveness was greatest for cannabis misuse ($d=0.81$), moderate for cocaine ($d=0.62$) and least for polydrug use ($d=0.24$), suggesting that more complicated and severe substance use disorders are the most difficult to treat. There was a particularly high drop-out rate (42%) from trials addressing cocaine use, which compares unfavourably against the effect size of 0.62 in those who completed treatment. Contingency management (14 studies) was most effective ($d=0.58$). There were 13 studies of cognitive-behavioural therapy (CBT) ($d=0.28$). The mean duration of treatment was 21 weeks. About one-third of patients achieved post-treatment abstinence, compared with 13% of controls – the abstinence rates were doubled by active treatment.

A comprehensive review of the effectiveness of treatment for alcohol problems has been published by the UK National Treatment Agency for Substance Misuse (NTA) (Raistrick 2006).

Alcoholics Anonymous, Narcotics Anonymous and other 12-step programmes

Alcoholics Anonymous (AA) was founded in 1935 and is now a worldwide voluntary organisation that provides support for problem drinkers. Its primary purpose is to encourage members ‘to stay sober and help other alcoholics achieve sobriety’ (www.alcoholics-anonymous.org.uk/About-AA/Newcomers/Who-we-are). The only requirement for membership is a desire to stop drinking. There is no doubt that AA contributes more to the treatment and support of people with alcohol problems than any other organisation, including any public health body or professional group.

Alcoholics Anonymous is run by participants themselves and is an entirely independent, non-profit organisation. Owing to its philosophy (Box 1), AA does not lend itself to randomised controlled trials (RCTs), and group members are necessarily self-selecting. However, AA is free, there is no waiting list and often members in large urban areas can attend daily meetings. People can attend AA indefinitely. AA promotes a buddy system in which new members are assigned a ‘buddy’ or sponsor, who is an abstinent (‘recovering’) member who has worked through

BOX 1 Principles of Alcoholics Anonymous

‘An AA group ought never endorse, finance or lend the AA name to any related facility or outside enterprise, lest problems of money, property and prestige divert us from our primary purpose’

‘Alcoholics Anonymous has no opinion on outside issues; hence the AA name ought never be drawn into public controversy’

(www.alcoholics-anonymous.org.uk/About-AA/AA-Traditions)

the Twelve Steps (www.alcoholics-anonymous.org.uk/About-AA/The-12-Steps-of-AA) and can be contacted in times of crisis.

Narcotics Anonymous (NA) developed from AA in the 1950s to address drug problems and it has similar values and procedures. It is estimated that there are more than 63 000 weekly NA meetings in 132 countries (Narcotics Anonymous 2014).

Effectiveness of 12-step approaches

A Cochrane review concluded that no studies unequivocally demonstrated the effectiveness of AA and other 12-step approaches in treating people with alcohol problems. This was based on a meta-analysis of eight trials with 3417 participants (Ferri 2006). One of these trials was Project MATCH, which I consider in more detail later in this article. A study of treatment for substance dependence reported that 12-step self-help group programmes were more cost-effective than CBT (Humphreys 2007).

Donovan (2008) highlights the clear correlation between abstinence and number of AA meetings attended. For example, Timko & DeBenedetti (2007) showed that abstinence rates increased from just over 25% to 80% proportionate to the individual’s attendance at 12-step groups (including Narcotics Anonymous). Carroll *et al* (1998a) reported similar results for people with dual cocaine and alcohol use problems. Patients in these trials were self-selecting. Donovan also notes systematic encouragement and community access (SECA) (Sisson 1981) and intensive referral (Timko 2006, 2007), empirically supported techniques devised to encourage patients to attend 12-step programmes. In SECA, counsellors give patients the details of AA meetings and telephone them to remind them to attend. Group members arrange to take individuals to meetings if they wish. In intensive referral, clinicians encourage patients to attend 12-step meetings by connecting them with 12-step volunteers. Abstinence rates from alcohol or drugs at 6 months following intensive referral increased to over 75% (Timko 2006).

Brief interventions, SIPS and Project MATCH

The World Health Organization (WHO) has defined brief interventions for alcohol-related problems as ‘practices that aim to identify a real or potential alcohol problem and motivate an individual to do something about it’ (McCambridge 2014). Brief interventions were originally devised for the large numbers of non-dependent ‘hazardous and harmful drinkers’ who present to hospital emergency departments. These individuals contribute the majority of alcohol-related cost to society, and controlled drinking is a reasonable option for them.

Brief interventions have been manualised by Babor & Higgins-Biddle (2001) and they often use the 10-item WHO Alcohol Use Disorders Identification Test (AUDIT). The interventions are a short form of psychotherapy that can be delivered in primary care (typically in a 5-minute consultation) to large populations with modest training of the therapist. Many brief interventions are based on motivational interviewing techniques.

Motivational interviewing[†] is a form of psychotherapy that targets the individual’s ambivalence towards an aberrant behaviour (Miller 2002). The therapist ‘rolls with resistance’: rather than challenging the behaviour directly, the therapist encourages the patient to identify problems that it causes and to suggest solutions. This is expected to create cognitive dissonance, so that the individual can recognise the harm resulting from their behaviour.

Brief interventions based on motivational interviewing techniques are typically delivered in a single session lasting up to 90 min, although typically 5 to 15 min.

The evidence base

Reviews and meta-analyses

A Cochrane review of 29 primary care trials reported that brief interventions were associated with a statistically significant reduction in alcohol consumption of 38 g (4–5 units) a week at 12 months, compared with typical control conditions of assessment only, treatment as usual or written information (Kaner 2007). This study reported no significant additional benefit of longer interventions compared with brief ones. However, it contained just one trial, based in Finland, that directly compared three differing intensities of brief intervention.

An earlier meta-analysis found that brief motivational interviewing yielded moderate effect sizes (0.25–0.57) compared with no treatment

and/or placebo for problems involving alcohol, drugs, and diet and exercise: a 56% reduction in drinking was reported. Paradoxically, the results did not support its efficacy in smoking or HIV-risk behaviours (Burke 2003). Similarly, in a review of 29 randomised trials of brief interventions based on motivational interviewing, 17 studies yielded at least one significant effect size for behavioural change, although the authors did not generate an overall effect size (Dunn 2001).

Rubak *et al* (2005) report a meta-analysis of 72 RCTs of motivational interviewing of varying duration for a variety of lifestyle problems. A significant effect was demonstrated in 40% of studies with one counselling session, compared with 87% of studies with more than five sessions (typically, sessions in each study lasted 60 min). These studies had an estimated median follow-up period of 12 months (range: 2 months to 4 years). Three quarters of the studies showed a positive response.

Vasilaki *et al* (2006) report a meta-analysis of 22 studies (with over 2000 participants) of brief motivational interviewing for excessive drinking (on average, the interviews took 87 min). They found an overall effect size of 0.18, although this was greater with shorter follow-up periods (less than 3 months; $d=0.6$). Ten of the studies involved patients who had not been seeking treatment.

Moyer *et al* (2002) report a widely quoted meta-analysis of 34 controlled trials comparing brief interventions (fewer than 5 sessions) for alcohol problems in non-treatment-seeking patients. Brief interventions were shown to be moderately effective, particularly for people with less severe alcohol problems ($d=0.14–0.67$).

One review estimates that brief interventions reduce alcohol consumption by around 24% compared with control conditions (Effective Health Care Team 1993). The interventions were estimated to cost £15–£40 per patient. The review also analysed 20 trials comparing brief interventions with extended treatment. There was no additional benefit of the extended treatment.

Thirteen studies have been reported of various brief interventions targeted at patients in emergency departments who had suffered injuries while intoxicated. Meta-analyses revealed that these did not significantly reduce subsequent alcohol consumption, but were associated with a reduction of about 50% in the odds of experiencing another alcohol-related injury (Harvard 2007).

Overall, the effect sizes for motivational interviewing are small and the trials report multiple outcome measures. Furthermore, the effects of brief motivational interviewing do

[†]The development and theory of motivational interviewing are outlined in Treasure J (2004) Motivational interviewing. *Advances in Psychiatric Treatment*, 10: 331–7. Ed.

seem to diminish over time (Miller 2005). In a meta-analysis of 72 clinical trials of all forms of motivational interviewing for a range of problems (Hettinga 2005), the mean effect size averaged across all reported outcome variables was 0.77 at 1 month, 0.39 at 1–3 months, 0.31 at 3–6 months, 0.30 at 6–12 months and 0.11 at follow-ups longer than 12 months. Such a deterioration in effect size over time is also reported in a trial of a single session of motivational interviewing to reduce drug consumption and related risk in young people (McCambridge 2005).

The SIPS trial

A recent trial has been reported of screening and brief alcohol intervention in primary care (SIPS) (Kaner 2013). This UK trial involved 756 patients identified in 34 primary care clinics to have hazardous or harmful drinking patterns. Participants were cluster randomised to a control group (an information leaflet), 5 min of structured brief advice, or 20 min of brief lifestyle counselling based on motivational interviewing methods. The outcome was self-reported hazardous or harmful drinking status as measured by the 10-item AUDIT at 6 and 12 months. In total, 84% of eligible patients took part and response rates at the two follow-up points were 83% and 79%. It was difficult to assess the fidelity of therapists to the interventions, although all were trained and had to pass a competency assessment. The mean baseline AUDIT score was 12.7, with 20% scoring less than 8.

The SIPS trial showed no significant difference in outcome by intention-to-treat analysis: over all groups, 35–39% scored less than 8 on the AUDIT at 12 months, indicating that about 1 in 5 patients moved out of the harmful or hazardous drinking category. AUDIT scores at 12 months ranged from 10.49 to 10.69: an improvement of about 15% or an effect size of about 0.2 compared with baseline. These results suggest that the assessment interview (the 10-item AUDIT) itself may have led to a sustained reduction in drinking by raising patient vigilance. Indeed, the authors concluded that the study produced no evidence that either brief advice or brief lifestyle counselling gave additional benefit over and above the delivery of feedback on the AUDIT plus a patient information leaflet.

Despite its rigorous methods and execution, the SIPS trial showed no benefit of a formal brief intervention. Hence, there remains uncertainty as to whether brief intervention or the assessment process itself can produce a modest change in drinking behaviour (Burke 2003; Vasilaki 2006; Lundahl 2010).

Project MATCH

There are other, more protracted motivational interviewing techniques such as the four 1-hour motivational interviewing sessions used in Project MATCH. The term ‘motivational enhancement therapy’ is often used to indicate more prolonged forms of motivational interviewing, to distinguish them from brief interventions.

Project MATCH was a \$27 million randomised trial sponsored by the US National Institute on Alcohol Abuse and Alcoholism (NIAAA). Lasting for 8 years and involving over 1700 alcohol-dependent people, it compared 12-session CBT, 4-session motivational enhancement therapy and 12-session 12-step facilitation therapy. The total number of abstinent days per month increased from 20% to over 80%, with up to 35% achieving complete abstinence for 1 year (Project MATCH Research Group 1998). However, the overall effect size between treatment groups was just less than 0.1 (Magill 2009). Outcomes were similar in all groups at 1 and 3 years. Project MATCH lacked a no-treatment control group. Consequently, it has yet to produce any clinically useful results other than to suggest that 4-session motivational enhancement therapy was more cost-effective than the other treatment options.

Contingency management

Contingency management involves rewarding positive behaviour. In drug misuse, this most commonly involves allowing patients on methadone maintenance treatment to take their doses of methadone home, rather than under supervision in the pharmacy. This and other techniques have been reviewed by Stitzer & Petry (2006).

Among the more controversial techniques in Stitzer & Petry’s review is voucher-based reinforcement therapy (VBRT), where patients receive vouchers whose monetary value increases following each successive negative drug test (e.g. from \$2 to \$25). Hence, abstaining for 12 consecutive weeks might produce a reward of \$1000. These vouchers are withheld when a drug test indicates recent use. Vouchers are exchanged for goods or services that are compatible with a drug-free lifestyle. Patients are not given money themselves – a staff member makes purchases on their behalf. Numerous variations of voucher-based reinforcement schedules are possible.

Another controversial contingency management technique has been termed the fish-bowl procedure. Negative drug tests allow patients to draw a voucher from a fish-bowl that can be exchanged for prizes worth between \$1 and \$100. This technique was devised to reduce the cost of

other voucher-reinforcement systems, especially where substantial cash rewards could be accrued.

The evidence base

Contingency management studies conducted in the 1970s and 1980s yielded a larger mean effect size than studies conducted in the 1990s (0.64 *v.* 0.35) (Prendergast 2006). This suggests either publication bias or that the non-specific influence of therapist enthusiasm enhanced the effects in the original trials. Prendergast *et al's* (2006) meta-analysis of 47 controlled studies published between 1970 and 2002 found a modest mean effect size (0.42) in favour of contingency management. However, effect sizes of about 0.65 were reported for studies involving opiate or cocaine users. Larger effect sizes were reported for earlier studies and studies with higher researcher involvement (suggesting patient selection or increased social desirability bias) or shorter treatment duration. The median sample size was 69, ranging from 12 to 844 (four studies had more than 200 participants).

A meta-analysis of 30 studies of voucher-based reinforcement therapy for substance use disorders reported an overall effect size of 0.32 (Lussier 2006). Greater effects were seen if the reinforcement was immediate (the effect size was twice that with delayed reward) and the effectiveness was proportional to the monetary value of the reward. Of the 30 studies, 16 fell into the small effect size range, eight into the moderate range and 6 into the large range.

A meta-analysis of 30 studies of contingency management involving patients receiving methadone reported an overall (average) effect size (*r*) of 0.25 with reinforcement of drug-free urine samples. The effects were greater when the reward was immediate (Griffith 2000). Methadone increases and take-home methadone yielded the largest effect sizes (*r*=0.55 and 0.39 respectively). Contingency management had a smaller effect if the reward was delayed for more than 1 day (*r*=0.56 *v.* 0.19). However, effect sizes were greatest when three urine samples were tested each week, rather than fewer than one each week (*r*=0.38 *v.* 0.16).

Uses of contingency management

Researchers have used contingency management to promote abstinence from many types of substance, including benzodiazepines, cocaine, nicotine, alcohol, opioids, marijuana and methamphetamine. Trials of contingency management have nearly always been conducted alongside another treatment, such as methadone maintenance. Contingency management has been used to change behaviours associated with reduced

drug use and for outcomes such as treatment attendance and retention (Prendergast 2006).

Contingency management has been shown to be effective for misuse of alcohol (Petry 2000), cocaine (Higgins 2000) and opioids (Petry 2002). However, a major problem with contingency management is the decline in the response after reinforcement has been discontinued (Prendergast 2006). For example, the benefits of contingency management to address benzodiazepine misuse in patients on opioid substitution therapy are lost when the reinforcement is removed (Stitzer 2006).

The politics of contingency management

The original studies of contingency management involved relatively high financial rewards (e.g. \$1000 for sustained abstinence from cocaine; Higgins 1994). More recent techniques involve much lower rewards (up to \$100; Petry 2002). In 2007, NICE released guidelines recommending modest prizes and financial rewards to encourage drug users to abstain. Although the evidence for this is clear (Petry 2002), opposition in newspapers and political pressure have meant that contingency management with financial rewards is not often used in the UK. Ultimately, using taxpayers' money to pay people to do what is in their own best interests is difficult to defend politically (Kendall 2013).

Contingency management has prominent ideological support and may have attracted a disproportionate amount of research funding, which skews the evidence base in its favour. Furthermore, researchers accept that some of the response is likely to be due to the Hawthorn effect – a non-specific response to the extra scrutiny involved in a contingency management programme with frequent drug tests.

The community reinforcement approach, behavioural couples therapy and UKATT

The community reinforcement approach (CRA) relies on family members and other individuals to reward patients for abstinence – for example, offering praise and taking part in enjoyable activities when the patient is sober (Abbott 1998). CRA was devised in the early 1970s by Hunt & Azrin and is closely related to behavioural couples therapy. Attempts are made at positive reinforcement of abstinence rather than punishment of intoxication. One technique is to negotiate rewards for sobriety initially over 1 month. Rewards should attempt to increase the individual's involvement with non-drinkers, including AA and church groups, sports events, voluntary programmes and job clubs, cinema and

hobbies. Therapists need to identify situations where significant others inadvertently reinforce drinking ('enabling'), such as lending money or being absent at high risk times.

Asking significant others to supervise disulfiram is an effective form of CRA (assessed in Luty 2015). Strictly speaking, disulfiram is an aversion therapy rather than a reward, but individuals can be rewarded for adherence to medication.

Community reinforcement and family training (CRAFT) is a variant of CRA specifically involving family members. Trials of CRAFT and CRA showed that the majority of clients were able to recruit a significant other to act as co-therapist (Meyers 1999; Miller 1999). CRA has also been widely used with heroin addicts on methadone (Abbott 1998) and even in homeless people (Smith 1998).

Behavioural couples therapy

Behavioural couples therapy (BCT) is a form of CRA involving partners (Epstein 1998; O'Farrell 2006). Powers *et al* (2008) report a meta-analysis of 12 RCTs (754 participants) of BCT with married or cohabiting individuals for the treatment of substance use disorders. It revealed an overall effect size of 0.54 for BCT compared with individual-based treatments. BCT promotes abstinence by means of a 'recovery contract' that involves both partners in a daily ritual to reward abstinence (studies involving supervised disulfiram were also included). The findings suggest that BCT results in better relationship functioning, but not in superior substance use outcome immediately after treatment. However, the improved relationship preceded a later reduction in substance use. There was no significant relationship between the number of treatment sessions and effect size (Powers 2008).

UKATT

The United Kingdom Alcohol Treatment Trial (UKATT) randomised 742 individuals with alcohol problems to three sessions of motivational interviewing or eight sessions of social behaviour and network therapy (SBNT), a technique designed to develop a supportive network of family and friends (UKATT Research Team 2005). At 12-month follow-up, there were no clinically significant between-group differences in outcomes, with both groups showing substantial reductions in alcohol consumption, dependence and related problems. There was no change in the biochemical measures, such as liver function tests and gamma-glutamyl transferase, between intake and 12-month follow-up. At 12 months,

the proportion of days abstinent had increased from 29% to 46%. For both groups, overall average alcohol consumption halved, from about 133 units per day to 70 units per day, although average consumption remained around three times sensible drinking limits. UKATT had no control group and therefore assumed that motivational interviewing was effective. However, it was not possible to estimate the natural rate of recovery, which was likely to be high in this self-selecting group: only 1 in 5 patients who attended the services took part in the study.

Cognitive-behavioural therapy and COMBINE

Cognitive-behavioural therapy (CBT) for addictive behaviours has been best described in regard to relapse prevention (Marlatt 2005). The technique, for which manuals are publicly accessible (Carroll 1998b), requires patients to identify high-risk situations and provides some skills training or other coping strategies to prevent substance use. CBT may involve an analysis of the function of substance use (e.g. to relieve dysphoric mood states or in the belief that the drugs are required to enjoy social occasions). Other techniques include stimulus control strategies, distress tolerance and drug-refusal training. CBT has been adapted specifically for cocaine dependence (Carroll 1998b).

The evidence base

Reviews and meta-analyses

Magill & Ray (2009) report a meta-analysis of 53 controlled trials of CBT for alcohol problems (23 studies) or illicit drug use (30 studies, including 11 on cocaine). The average sample size was 179, although the two largest involved 1656 participants (Project MATCH) and 1383 (COMBINE). Six other studies – four involving cannabis – had more than 200 participants. The majority of studies involved patients with dependent substance use. Attrition rates were unusually low, at just under 20%, indicating highly motivated patients. The meta-analysis reported a very small overall effect size of 0.15 for CBT, which diminished further at 6- and 12-month follow-ups. In contrast, there were significant positive effect sizes in the control and treatment-as-usual groups, indicating significant improvement in these patients. The effect size was largest for the 6 studies of CBT for cannabis use disorders (effect size of 0.5), although the small number of studies may introduce significant publication bias despite the fact that the studies themselves were large – involving over 1000 patients in total. It is also possible that people with cannabis use disorders have better social

support and psychological adjustment than people with other substance use disorders, which would mitigate towards a better prognosis.

The meta-analysis by Magill & Ray (2009) includes many reports revisited in a subsequent meta-analysis of trials of CBT for primary illicit drug use disorders carried out by McHugh *et al* (2010). Evaluating 34 RCTs (a total of 2300 patients), McHugh and colleagues reported that, overall, CBT had the largest effect on cannabis dependence, followed by opioid dependence and polysubstance dependence. The overall effect size was 0.45 (conventionally defined as 'modest').

Project MATCH and COMBINE

As mentioned earlier, the overall between-group effect size of Project MATCH (1656 patients with alcohol misuse randomised to CBT, motivational interviewing or individual 12-step facilitation over 12 months) was just less than 0.1 (Magill 2009).

The Combined Pharmacotherapies and Behavioral Interventions (COMBINE) study involved 1383 patients with alcohol dependence randomised, following detoxification, to nine separate combinations of CBT, naltrexone and acamprosate over 3 months. Eight groups also received a brief intervention from the prescribing physician. Half of the participants were randomised to CBT (up to 20 sessions of 1 hour duration). CBT had no additional benefit relative to monotherapy with active medication (Pettinati 2006). During treatment, all groups reduced their alcohol consumption, with 73–80% of days abstinent in the previous month. The CBT-only group (with no placebo tablets or physician brief intervention) responded poorly (66% of days abstinent) compared with the other treatment options, including placebo medication.

Disulfiram has been combined with CBT in the treatment of cocaine dependence (Carroll 2004). In this study, 121 cocaine-dependent people were randomised to one of four treatment conditions: disulfiram plus CBT, disulfiram plus interpersonal psychotherapy, placebo plus CBT, and placebo plus interpersonal psychotherapy (the two psychotherapies were delivered in 12 weekly sessions). Disulfiram was more effective than placebo in reducing cocaine use (confirmed by urine drug screens) and it was also more effective than either form of psychotherapy alone. Similarly, CBT was more effective than interpersonal psychotherapy. It is notable that the trial failed to report the proportion of cocaine-positive urine samples, instead deriving statistical composites. Overall, CBT plus placebo reduced the frequency of cocaine use by about half over the 12-week trial,

whereas CBT plus disulfiram reduced its use by over three-quarters. However, half the sample also met criteria for alcohol misuse or dependence and the benefits were primarily due to reduced use of cocaine in the patients who remained abstinent from alcohol.

Oude Voshaar *et al* (2003) compared gradual (over 3 months) benzodiazepine dose reduction with treatment as usual in 180 people attempting to discontinue long-term benzodiazepine use and reported cessation rates of 62% *v.* 21%. Additional CBT did not improve outcomes. Many of the patients were in receipt of prescribed benzodiazepines rather than obtaining these drugs from illicit suppliers (which is more typical of patients attending drug and alcohol services).

Coping skills training

In coping skills training, which is often subsumed within CBT, patients are taught how to refuse drugs and alcohol. As described by Monti *et al* (1995), each session includes an explanation of the rationale, skills guidelines and behavioural role-play, with feedback and reinforcement. Topics include: drink refusal skills; giving praise; giving effective criticism; receiving criticism, particularly about drinking; listening skills; conversation skills; developing sober supports; and conflict resolution.

Evidence base

There is some evidence-based support for this technique (Monti 2001). Rohsenow *et al* (2001) report an RCT involving 100 alcohol-dependent participants with 12-month follow-up. After a 2-week residential detoxification, participants were randomised (in a 2 x 2 design) to cue exposure treatment plus coping skills training, communication skills training, a meditation-relaxation control or an education control. There was a significant improvement in drinking outcomes in the cue exposure treatment plus coping skills group, with a reduction in the number of drinking days from ~60% to 10% in those who adhered to medication.

Burtscheidt *et al* (2002) report a 2-year follow-up of 120 alcohol-dependent individuals randomised to coping skills training (32 participants), CBT (31) or a control group (40); 23 of the original sample were lost to follow-up. The follow-up showed no significant difference between the two experimental and the control groups. Fewer than 26% of the participants in any group were classified as 'improved' or 'abstinent'. Furthermore, only 15% of those approached to participate (patients from an in-patient detoxification ward) actually

took part in the project. So even though the sample is highly selective the results are disappointing.

Residential rehabilitation

Previous reviews of settings for treating alcohol misuse have concluded that there is no evidence for the superiority of in-patient over out-patient treatment (Miller 1986; Mattick 1993; Luty 2006). This has led to scrutiny of the more protracted admissions to residential rehabilitation. Residential rehabilitation programmes require patients to stay overnight in the facility and usually to abstain from substances before and during the programme. These programmes are usually for periods of several weeks or months (compared with in-patient detoxification which typically occurs over 1–2 weeks). Residential rehabilitation and therapeutic communities, usually located outside urban areas, were the mainstay of addiction treatment in the past.

Residential rehabilitation typically involves only 2% of patients in adult drug treatment, although it accounts for 10% of treatment costs. (In the UK, these costs are often passed on from the health service to Social Services.) The NTA (2012) reports that, on average, residential rehabilitation costs £600 a week, making it the most expensive treatment option for substance misuse. Consequently, residential programmes are often reserved for people with the most complicated or high-risk problems.

Evidence base

Effectiveness

Analysis of 4000 admissions to residential rehabilitation in the UK showed that 28% of people admitted for drug problems achieved long-term abstinence (NTA 2012). A further 14% subsequently achieved abstinence in a community drug treatment agency. (Abstinence in this case presumably referred to abstinence from all drugs, including prescribed methadone.) There was a high drop-out rate, with around half of admitted patients leaving before the residential programme was complete – usually in the first 2 weeks. The NTA suggests that residential programmes may be better for people with alcohol than with drug problems. However, a 40% success rate (that is, significant periods of abstinence after discharge from a residential programme) is an excellent overall outcome considering the more complex nature of the patient group. By contrast, Prendergast *et al* (2002) estimated that residential rehabilitation or therapeutic communities had an effect size of 0.25 – approximately half that reported for methadone maintenance.

Cost-effectiveness

Whether residential rehabilitation is cost-effective remains controversial, especially as 14% of participants in the NTA study required further community support after discharge from rehabilitation and an unknown proportion may have achieved abstinence in the community anyway. Unfortunately, there are no RCTs of residential rehabilitation and the outcomes are likely to be influenced by patient selection. Support for the relatively expensive residential programmes is often dependent on public opinion and a political preference for abstinence-based options (rather than harm reduction, as exemplified by methadone maintenance).

Methodological problems of research and its analysis

As mentioned in my previous article (Luty 2015), a review of the methodological problems of addictions research could occupy several articles. Studies of psychological interventions are even more prone to bias than classic placebo-controlled trials of medication: they can be influenced, for example, by social desirability bias, especially in subjective outcome measures, therapist enthusiasm (Box 2) and fidelity to the intervention. Obtaining suitable controls conditions is much harder in psychological research and researchers do not have access to potential funding from pharmaceutical companies.

In analysis of results, it is important to discriminate between trials that recruit problem drinkers (who can have relatively good outcomes) and those that recruit dependent drinkers (who

BOX 2 An illustration of ways therapist enthusiasm can artificially enhance treatment response in research

Patients in research studies tend to have much better outcomes than those in routine practice, and one reason for artificially high response rates is the enthusiasm of therapists. Manualised interventions for research trials tend to require huge commitment by therapists. For example, according to the National Institute on Drug Abuse's manual for a community reinforcement approach plus vouchers to treat cocaine addiction, therapists conduct 36 one-hour sessions (initially two each week) over 6 months with additional brief telephone calls 'as required' (Budney 1998). This is far beyond the resources of most standard clinics.

Overall the manual recommends, 'Therapists do whatever it takes to help patients make

lifestyle changes' (p. 10). This includes taking patients to appointments or job interviews, making home visits, arranging transportation, conducting full sessions even if patients are late and being willing to meet patients almost any time of day. None of this would be normal practice in most substance misuse or psychotherapy services. Indeed, these measures would be regarded as boundary violations and are hopelessly unrealistic.

Of course such efforts to retain patients in intensive treatment are likely to produce superior results, regardless of the form of treatment provided, and they create artificially high response rates unrelated to the technique under review.

are much more refractory). Similarly, there is often a distinction in outcomes between trials that recruit patients directly from the community (who tend to have better outcomes) and those that recruit clinical populations or 'treatment-seeking' patients (who are often more refractory).

Selective publication remains a problem. For comparison, it is estimated that publication bias leads to overestimation of the effect size of antidepressants by around 20% (Ambresin 2014). There are statistical corrections for publication bias, provided a sufficient number of independent trials have been performed. Unfortunately, this is seldom the case and meta-analyses are often dominated by a few very large trials (such as Project MATCH and COMBINE). Sadly, government funding tends to require researchers to develop new treatments rather than to confirm the effectiveness of current therapies. Hence, there are often few comparable trials for each form of psychotherapy.

It is informative to note that studies of CBT (like many other forms of psychotherapy) report the largest effect sizes: (a) in quasi-experimental studies (where there is some degree of patient selection); (b) where outcomes were measured immediately after treatment; and (c) in studies with self-reported outcomes. There are usually significant positive effect sizes in the passive or treatment-as-usual control groups as well, indicating significant improvement with these comparators (Magill 2009). This tends to be a great problem with psychotherapy trials for substance misuse in which the control groups also make major improvements. This is especially prominent where patients are recruited directly by screening people from the community rather than clinical populations.

Outcome measures and effect sizes

There remains no consensus on agreed outcome measures for the effectiveness of alcohol treatment. Multiple outcome measures such as combination scores are often reported. Many programmes have traditionally focused on abstinence, in which case the time to first relapse (e.g. the consumption of more than 5 standard drinks or 40 g of alcohol in 24 h) is an appropriate measure. However, in practice, the number of drinking days over a given period is probably more relevant, especially if a 'relapse' lasts for only one day. Similar problems occur with illicit drugs, although objective drug screens are often reported. Drug tests are more reliable than self-report. For example, self-reported drug use produces a greater effect size than urine testing for drugs (0.61 v. 0.33; Dutra 2008).

Unfortunately, research on alcohol misuse often relies on self-report, and research into psychosocial effects often uses multiple subjective measures of well-being, which are particularly prone to bias. In the meta-analysis mentioned earlier of BCT for alcohol and drug use disorders, Powers *et al* (2008) reported an effect size of 0.54. However, it was based on improvement in relationship quality rather than reduced substance use (although there was a delayed reduction in substance misuse). One of the unforeseen problems of using statistically devised effect sizes is that they can reflect multiple subjective outcomes that may not be immediately relevant to the question under study and may also be prone to subjective bias.

For reference, a meta-analysis by Kirsch & Sapirstein (1998) estimated that an inert placebo effect has an effect size of 0.79 in patients with depression (this is likely to be much greater using an active placebo). Furthermore, Bowers & Clum (1988) estimated that non-specific psychological interventions (such as an assessment interview) had an effect size of 0.21. Similarly, two controlled trials have reported significant clinical effects of screening and assessment alone. McCambridge & Day (2007) report a study of 421 university students aged 18–24 years in London. Half of the group was randomised to complete the 10-item AUDIT screening questionnaire at baseline. The primary outcome was the between-group difference in AUDIT score at 2–3 months. A statistically significant effect size of 0.23 was reported on this primary outcome: AUDIT scores at 3 months were 8.3 in the experimental group v. 9.7 in the control group. Statistically significant differences were also noted in three of eight secondary outcomes, including heavy drinking days (10+ units in the past 7 days: experimental 26% v. control 38%) and exceeding sensible drinking limits (experimental 36% v. control 41%). The results may indicate a Hawthorne effect in which drinking behaviour has changed in response to monitoring by completing the AUDIT questionnaire. The effect size of 0.23 has significant implications for the results of other psychosocial treatments for substance use disorders, as many produce smaller effects. Kypri *et al* (2007) report a trial involving 975 students (17–29 years old) attending a primary healthcare clinic who completed the AUDIT online. Of the 599 who scored 8 or above, 293 were randomised to receive either an information leaflet plus 10 minutes of web-based assessment of alcohol consumption 4 weeks later or an information leaflet alone. Mean baseline AUDIT scores for the two groups were 14.9 v. 15 respectively. At 12-month follow-up, the experimental group reported lower overall total

consumption (25 v. 30 drinks in previous 2 weeks) and lower AUDIT scores (13 v. 14).

In conclusion

Griffith Edwards and colleagues conducted a classic RCT involving 100 men with alcoholism which, at 12-month follow-up, found no difference in outcome between those that had received comprehensive, intensive treatment and those that had received just one counselling session (Edwards 1977). These results have been confirmed in other populations. For example, Chapman & Huygens (1988) reported a study involving 113 male alcoholics in New Zealand randomised to a single confrontational interview or a 12-week programme with 6 weeks of in-patient treatment. There was no significant difference in outcome between the groups, with around one-third of all participants abstinent at 18-month follow-up.

Such disappointing results continue to cause great anxiety among practitioners: more recently, some very large trials (Project MATCH, COMBINE and UKATT) have shown no clinically significant difference between intervention groups. These large trials lacked a non-treatment group and the authors often assume that brief interventions (often based on motivational interviewing) were moderately effective. Consequently, they conclude that the other treatments (such as CBT) were equally effective. As mentioned earlier, evidence from the large SIPS trial 'does not support the additional delivery of five min of brief advice or 20 min of brief lifestyle counselling over and above the delivery of feedback on screening plus a patient information leaflet' (Kaner 2013). Previous reviews have often suggested that more prolonged or intense treatment has little benefit over treatment of shorter duration (Mattick 1993; Magill 2009). Thus, despite the optimism of researchers, the evidence for effectiveness of psychosocial treatments in substance misuse remains disappointing and brief interventions seem to be getting briefer.

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MCQ answers

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MCQs

Select the single best option for each question stem

1 Significant methodological problems in appraising psychosocial treatment include:

- a social desirability bias
- b therapist enthusiasm
- c publication bias
- d fidelity to treatment protocol
- e all of the above.

2 Alcoholics Anonymous:

- a was founded in 1976
- b is based on techniques of cognitive-behavioural therapy
- c is entirely independent of other organisations and is non-profit making
- d has been shown to be effective in many randomised trials
- e is restricted to the USA and UK.

3 The SIPS trials:

- a took place in the USA
- b involved brief interventions with about 760 patients
- c use the Positive and Negative Syndrome Scale (PANSS) as an outcome measure
- d showed a clear benefit of motivational interviewing over other treatments
- e involved social behaviour and network therapy.

4 Which of the following is not a conventional component of cognitive-behavioural therapy?

- a response prevention
- b coping skills training
- c distress tolerance
- d drug-refusal training
- e functional analysis.

5 Which of the following is not true of contingency management?

- a voucher-based reinforcement therapy is a common strategy
- b the fish-bowl procedure is a suitable alternative
- c traditional methods may lead to rewards of up to \$1000 for abstinence
- d meta-analysis shows that contingency management is one of the most effective psychosocial treatments for substance misuse
- e there have been no serious controversies regarding use of financial rewards to promote abstinence.