Review

Psychological interventions for alcohol misuse among people with co-occurring depression or anxiety disorders: A systematic review

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A B S T R A C T

Objective: Depression, anxiety and alcohol misuse frequently co-occur. While there is an extensive literature reporting on the efficacy of psychological treatments that target depression, anxiety or alcohol misuse separately, less research has examined treatments that address these disorders when they co-occur. We conducted a systematic review to determine whether psychological interventions that target alcohol misuse among people with co-occurring depressive or anxiety disorders are effective.

Data sources: We systematically searched the PubMed and PsychINFO databases from inception to March 2010. Individual searches in alcohol, depression and anxiety were conducted, and were limited to ‘human’ published ‘randomized controlled trials’ or ‘sequential allocation’ articles written in English.

Study selection: We identified randomized controlled trials that compared manual guided psychological interventions for alcohol misuse among individuals with depressive or anxiety disorders. Of 1546 articles identified, eight met inclusion criteria for the review.

Data extraction: From each study, we recorded alcohol and mental health outcomes, and other relevant clinical factors including age, gender ratio, follow-up length and drop-out rates. Quality of studies was also assessed.

Data synthesis: Motivational interviewing and cognitive–behavioral interventions were associated with significant reductions in alcohol consumption and depressive and/or anxiety symptoms. Although brief interventions were associated with significant improvements in both mental health and alcohol use variables, longer interventions produced even better outcomes.

Conclusions: There is accumulating evidence for the effectiveness of motivational interviewing and cognitive behavior therapy for people with co-occurring alcohol and depressive or anxiety disorders.

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1. Introduction

Epidemiological surveys consistently indicate that depressive, anxiety and alcohol use disorders frequently co-occur (Farrell et al., 2001; Grant et al., 2004; Kessler et al., 2003). Studies conducted in the United States and Australia have found that individuals with alcohol dependence are three to four times more likely to have a concurrent affective or anxiety disorder compared to the general population (Degenhardt et al., 2001; Grant et al., 2004). Even higher rates of comorbid disorders are found within treatment settings. In a large population study, 32.8% of participants with alcohol use disorders who sought treatment were found to have comorbid depression and 33.4% were found to have a comorbid anxiety disorder (Grant et al., 2004). Such high rates are problematic as co-occurring alcohol, depressive and anxiety disorders have been associated with a broad range of negative outcomes, including more severe depressive and anxiety symptoms and suicidal ideation, poorer social functioning and increased service utilization (Sullivan et al., 2005). In terms of treatment outcomes, while individuals with and without comorbid conditions improve, those with co-occurring conditions continue to drink more, have poorer physical and mental health outcomes, and display poorer functioning following treatment (Mills et al., 2009).

Psychological treatments for unipolar depression, anxiety and alcohol use disorders have separately been shown to be effective. Meta-analyses examining randomized controlled trials (RCTs) of cognitive behavior therapy (CBT) for adult unipolar depression, anxiety or alcohol disorders have found that CBT is superior to waitlist and untreated controls, as well as pharmacotherapy (Dobson, 1989; Gloaguen, 1989; Hofmann and Smits, 2008; Magill and Ray, 2009; Norton and Price, 2007; Stewart and Chambless, 2009). During the last 30 years, there has been a significant paradigm shift from the dichotomous concept of ‘normal drinking’ versus an ‘alcohol use disorder’ to the concept of a spectrum of hazardous to harmful drinking, delineated as ‘alcohol misuse’ (Saunders and Lee, 2000). Two meta-analytic reviews have found evidence for the efficacy of brief (often one session) motivational interviewing (MI) interventions for alcohol misuse, with one finding a medium effect in non-treatment seeking populations and a small to moderate effect in treatment seekers (Hettema et al., 2005; Moyer et al., 2002).

Although there have been numerous trials examining the effectiveness of psychological interventions for unipolar depression, anxiety disorders and alcohol misuse separately, relatively few have been conducted for individuals with depressive or anxiety disorders and comorbid alcohol misuse. Nevertheless, a number of recent reviews have demonstrated the effectiveness of psychological interventions for co-occurring substance misuse and unipolar depression (assessed via diagnostic interview or ratings/questionnaires with cut-off scores indicative of a clinical disorder), dysthymia or anxiety disorders. Hesse (2009) reported that integrated psychological treatments that combine treatment for substance use disorders and co-occurring depression or dysthymia into one program had superior outcomes in terms of the percentage of days abstinent compared with treatment for substance use disorder alone. Similarly, Hides et al. (2010) found support for the efficacy of CBT over no treatment control conditions among patients with co-occurring unipolar depression or dysthymia and substance misuse (including alcohol). Baillie and Sannibale (2007) reviewed clinical trials for co-occurring anxiety and substance use disorders and concluded that standard care for substance use had the best outcomes for those with more than moderate substance dependence in five of the six studies reviewed.

No previous studies have systematically examined the efficacy of psychological interventions for patients with unipolar depression, dysthymia or anxiety disorders and co-occurring alcohol misuse specifically (rather than substance misuse per se). This is important because treatment may be differentially effective according to the type of substance misuse. Baker et al. (2009a), for example, found brief interventions were effective for alcohol misuse but only somewhat effective for cannabis misuse in people with severe mental disorders. In this article, we systematically review the evidence...
from RCTs of psychological intervention for co-occurring alcohol misuse among people with unipolar depression, dysthymia or anxiety disorders and provide recommendations for clinical management and future research.

2. Method

The study search protocol included RCTs of psychological interventions for co-occurring alcohol misuse among people with mood or anxiety disorders. Inclusion and exclusion criteria were established prior to the literature search. Included studies were required to employ diagnostic criteria for mood (unipolar depression or dysthymia) or anxiety disorders; to utilize a treatment manual and to report data on alcohol use outcomes. Psychological interventions were operationalized as non-pharmacological treatments for either alcohol misuse alone or alcohol misuse and mood or anxiety disorders.

During March 2010, a systematic literature search was conducted using the PubMed (ISI) and PsychINFO (CSA) databases. Individual searches in alcohol, depression and anxiety (search terms: depression, major depression, depressive disorder, anxiety, anxiety disorders, dysthymia, affective disorders, mood disorders) and treatment (search terms: treatment and therapy) were conducted, and were limited to ‘human’ published ‘randomized controlled trials’ (RCTs) or ‘sequential allocation’ articles written in English (so as to maximize methodological quality). Sequential allocation refers to the allocation of participants to treatment groups as they sequentially arrive in a treatment trial, allowing the trial to remain as balanced as possible throughout the recruitment process (Atkinson, 2002). It was included in our search strategy as it was considered to be a potentially sound method of treatment allocation, compatible with randomization. No date limits were placed on the searches. The alcohol, depression, anxiety and treatment searches produced a total of 1540 papers. By reviewing the titles, abstracts and reference lists, one author (LT) identified 34 potentially relevant studies. Two authors (AB and SH) then independently reviewed these articles in full, and identified eight RCTs to be included in the literature review. Inpatient studies with samples of participants with a variety of disorders and a larger proportion of patients with psychotic disorders compared to affective disorders were not included in the review. The full study selection process is shown in Fig. 1.

In addition to the narrative systematic review, effect sizes for alcohol use, depression and anxiety outcomes were compared between studies and between treatment conditions. Effect sizes were not compared for mental health outcomes due to heterogeneity in the patient samples used in the studies. One author (AB) extracted means and standard deviations of occasions of alcohol use per day, days of alcohol use per week/month, days of heavy drinking, percentage of days abstinent from drinking, depression severity ratings and anxiety severity ratings from each article (when available), which were then independently checked by a second author (SH). Cohen’s $d$ paired standardized mean differences were computed comparing alcohol, depression and anxiety variables at baseline and immediately following treatment (or equivalent timepoint for control conditions) using Comprehensive Meta-Analysis. Calculating a pooled effect size (combining the study effect sizes of the 8 studies), which would usually occur during a meta-analysis was inappropriate, due to considerable heterogeneity in the clinical characteristics of participants, and the type of treatment and measures used.

Fig. 1. Study selection process.
<table>
<thead>
<tr>
<th>Study</th>
<th>Sample</th>
<th>Diagnoses (%)</th>
<th>Entry criteria</th>
<th>Design</th>
<th>Results</th>
<th>Clinical significance of results</th>
<th>Methodological limitations</th>
<th>PEDro Scale quality rating (items v and vi blank)</th>
<th>Composite score</th>
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<tbody>
<tr>
<td>Baker et al. (2009a, 2009b) Australia Comorbid depression and alcohol misuse</td>
<td>N = 284, Outpatients Male = 53.0% Mean age = 45 Participation rate: 284/433 (65.6%); 149 (34.4%) refused</td>
<td>DSMIV (SCID): 76% lifetime MD 77% lifetime AUD</td>
<td>BDI &gt; 16 At least 4 standard drinks per day for men, 2 for women Concurrent medication (61%) and substance use (13% used cannabis at least weekly) not excluded</td>
<td>BI 1 × 60 minute session alone or plus 9 60 minute sessions of MI/ CBT depression, alcohol or integrated focus. Psychologists delivered manual guided intervention. Follow up 18 wks after baseline: 238/284 (84%). Collateral reports verified self-reported alcohol consumption.</td>
<td>Percentage of treatment sessions attended: 86% for the BI; 16% none; 28% 1–4; 17% 5–8; 39% 9–10. Of those offered 10 sessions, mean no. of sessions attended was 5.76, with no differences between conditions. Depression: significant reduction for all conditions, no differences between conditions; trend for integrated focus to be more effective than single focus. Alcohol: 10 sessions more effective than BI; integrated more effective than single focused; for men, alcohol focus more effective than depression focus.</td>
<td>Mean BDI change score for integrated vs. single focus condition was 11.5 vs. 8.2. Alcohol: 10 sessions associated with 22.9 vs. 10.8 drinks per week reduction and 1.3 vs. 0.6 reduction in drinking days. Integrated focus associated with reduction in 1.83 vs. 0.9 drinking days reduction. Men reported mean drinking reduction of 4.6 vs. 0.34 drinks per day in alcohol vs. depression focus. Thus, BI and extended treatment helpful for depression. Integrated or alcohol focus best for men, integrated focus best for women.</td>
<td>Only short-term outcome reported. 14% of sample were still in treatment at 18-week follow-up.</td>
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<td>Kay-Lambkin et al. (2009) Australia Comorbid depression and alcohol and/or cannabis misuse</td>
<td>N = 97, Outpatients Male = 46.0% Mean age = 35 Participation rate: 97/116 (83.6%); 19 (16.4%) refused</td>
<td>DSMIV (SCID-RV)</td>
<td>BDI &gt; 16 At least 4 standard drinks per day for men, 2 for women (n = 52/97 met alcohol criteria; 53.6%); or at least weekly use of cannabis (69/97; 71.1%) Concurrent medication not excluded (% not reported)</td>
<td>BI 1 × 60 minute session alone or plus 9 60 minute sessions of MI/ CBT psychologist or computer-delivered MI/ CBT (with brief weekly input from a psychologist). Manual guided. Follow up 12 ms: 41/52 (78.9%)</td>
<td>Percentage of treatment sessions attended: 87% for the therapist-delivery group, mean of 9/10 sessions; 76.1% for the computer-delivery condition, mean of 8/10 sessions. Depression: significant reduction for all conditions; MI/CBT more effective than BI. Alcohol: Significant reduction for all conditions, no differences between conditions.</td>
<td>% Improved at 12 months: Depression (% BDI &lt; 17): BI (30.4%); psychologist (50%); computer (63%). Alcohol (&lt;49% improvement in alcohol consumption): BI (53.8%); psychologist (82.4%); computer (73.3%). Thus, BI helpful for depression and alcohol problems, with additional improvement following longer intervention.</td>
<td>Use of only one therapist. Small sample (97) of whom 52 met alcohol entry criteria. Therapy adherence and fidelity not rated. Reliance on self-report measures.</td>
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### Markowitz et al. (2008) USA

**Comorbid dysthymic disorder and AUD**
- **N = 26 Outpatients**
  - Male = 60.0%
  - Mean age: 38
- **Participation rate: Not stated.**

<table>
<thead>
<tr>
<th>DSMIV (SCID-NP)</th>
<th>Primary DSMIV dysthymic disorder with early onset (before age 21), Score &gt; 13 on HAM-D; GAF &lt; 61; and DSMIV alcohol abuse secondary to dysthymic disorder. Concurrent psychoactive medications and substance abuse or dependence excluded except for cannabis abuse (% not reported). New inpatients on psychiatric wards. AUDIT score &lt; 7, AUDIT-Hazardous 28.3% Harmful 42.5% Dependent 29.2%</th>
<th>16–18 30-min sessions over 16 wks manual guided IPT-D vs. BSP delivered individually by therapists with MSW or PhD degrees. Post-treatment assessment at wk 16: 18/44 (40.9%). Breathalyzer verified alcohol consumption.</th>
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<tr>
<td>100% primary dysthymic disorder; 54% current MD; 77% dysthymic disorder with early onset; 77% Axis II disorder; AUD (lifetime): 77% dependence; 23% abuse.</td>
<td>43% of IPT and 42% of BSP Ss failed to complete tx. Mean no. of sessions not reported. Depression improved significantly for the sample as a whole. IPT significantly better than BSP on BDI at 16 wks. High% of Ss reported abstinence in the month before tx.</td>
<td>BDI: IPT: 18.9 (pre); 8.9 (16 wk). BSP: 25.1 (pre); 20.1 (16 wk). ES: −1.38 vs −0.64. Mean% days abstinent: IPT 40.4% (pre); 47.0% (16 wk). BSP: 32.1% (pre); 49.7% (16 wk). ES: 0.21 vs 0.54.</td>
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Small sample. High level of baseline abstinence. High level of tx dropout. No follow-up. Therapy adherence deemed adequate; fidelity ratings not reported.

### Hulse and Tait (2002) Australia

**Psychiatry inpatients with alcohol misuse**
- **N = 120 Voluntary psychiatry inpatients**
  - Male = 54.2%
  - Mean age: 32
- **Participation rate: 120/144 (83.3%)**

| DSMIV (from hospital records) | Primary DSMIV dysthymic disorder with early onset (before age 21), Score > 13 on HAM-D; GAF < 61; and DSMIV alcohol abuse secondary to dysthymic disorder. Concurrent psychoactive medications and substance abuse or dependence excluded except for cannabis abuse (% not reported). New inpatients on psychiatric wards. AUDIT score < 7, AUDIT-Hazardous 28.3% Harmful 42.5% Dependent 29.2% | 45 minute individually delivered MI following a template by nurses or clinical psychologists vs. information package. 6/12 follow-up: 83/120 (69.2%) |
| 62.5% mood 15.8% anxiety 10.0% psychotic 11.7% other AUDIT Hazardous 28.3% Harmful 42.5% Dependent 29.2% | Both conditions reduced alcohol consumption significantly. The MI condition had a significantly greater change in weekly alcohol consumption and a greater proportion was improved. Mental health outcomes not reported. The difference in alcohol consumption per week between conditions was just over 3 drinks per week, which the authors describe as clinically meaningful. |

### Santa Ana et al. (2007) USA

**Psychiatry inpatients with SUD**
- **N = 101 60 voluntary and 41 non-voluntary non-psychotic psychiatry inpatients**
  - Male = 62.4%
  - Mean age: 37
- **Participation rate: 101/211 (47.8%)**

| DSMIV (Interview not specified): 78.2% MD/mood 13.9% Bipolar 3% Schizoaffecive 2% Borderline Alcohol dependence 67% | Current DSMIV SUD and Axis I disorder other than dementia or psychosis |
| 2 × 120 minute group MI sessions following manual vs. 2 × 120 minute therapist attention activity control group conducted by a psychologist. 1/12 follow-up: 97/101 (96%); 3/12 follow-up 87/101 (86%) | No difference between conditions in proportion attending aftercare or attaining abstinence. MI had more favorable drinking outcomes at 1- and 3-months. Mental health outcomes not reported. |

At 3-months MI groups reported more aftercare attendance (mean of 21.1 vs. 10.7 occasions), fewer standard drinks (mean 117.3) vs. control condition (262.3) and a lower proportion binge drinking (34.1% vs. 55.8%).

Subjects had non-severe mental disorders admitted to general hospital units and included multiple disorders. The intervention cannot be separated from psychiatric tx. No therapy adherence or fidelity ratings. Large loss to follow-up. Reliance on self-report measures. Use of only one therapist. Alternate group assignment following initial randomization.

### Schade et al. (2005) Netherlands

**Comorbid agoraphobia or**
- **N = 96 65 from an inpatient clinic and 31 from an outpatient clinic for alcohol**

| DSMIV (SCID-1/P): 66.6% social phobia 7.3% agoraphobia 26% both Alcohol dependence 100% | DSMIV diagnosis of alcohol dependence and comorbid agoraphobia or social phobia Concurrent |
|  | Average no. of sessions attended was 9.15/47 (31.9%) used fluvoxamine. Significant improvement in 32 wks: Improvement on Fear Q total mean from 40.1 to 32.7 in the 27% and 38% in alcohol treatment vs. Optional fluvoxamine included in tx condition but unrelated to outcome. |

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<tr>
<th>Study</th>
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<th>PEDro Scale quality rating (items v and vi blank)</th>
<th>Composite score (total 9)</th>
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<tbody>
<tr>
<td>Toneatto (2005) Canada</td>
<td>Comorbid agoraphobia and alcohol dependence</td>
<td>N = 14 outpatients Male = 42.9% Mean age: 41</td>
<td>DSM-III-R (SCID): Panic disorder with agoraphobia and alcohol dependence 100% Lifetime MD (35.7%) Lifetime dysthymia (35.7%) Lifetime social phobia (28.6%) Axis II (50%)</td>
<td>DSM-III-R Panic disorder with agoraphobia and alcohol dependence Concurrent substance dependence excluded; medication not stated</td>
<td>Anxiety outcomes for both conditions, significantly better improvement in the anxiety tx group. No difference in relapse or abstinence between intervention conditions.</td>
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<td>44.1 to 21.9 in alcohol and anxiety tx respectively. Days heavy drinking (last mth) fell from 14.8 at baseline to 7.7 in the alcohol tx condition and from 19.5 to 5.9 in the alcohol and anxiety tx condition. 32 wks: Abstinence 27% and 38% in alcohol tx vs. alcohol respectively. Days heavy drinking (last mth) fell from 14.8 at baseline to 7.7 in the alcohol tx condition and from 19.5 to 5.9 in the alcohol and anxiety tx condition.</td>
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<td>social phobia and alcohol dependence</td>
<td>Male = 67.7% Mean age: 42 Participation rate: 96/157 (61.1%). Of 157 interviewed, 31 were excluded, 30 refused.</td>
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<td>4/14 (36.8%) met low risk drinking criteria and 3/14 (21.4%) met medium risk drinking criteria at both post-treatment and follow-up. 6/13 (46%) were improved on several clinical dimensions of anxiety at post-treatment and 4/12 (33%) at follow-up.</td>
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</table>
Randall et al. (2001) USA Comorbid social phobia and alcohol dependence N = 93 Outpatients Male = 69.0% Mean age: 38 Participation rate: Of 187 screened, 110 met inclusion criteria. 17 of these were later excluded from analysis, leaving 93/110 (84.5%).

DSMIII-R (SCID): Social phobia and alcohol dependence Concurrent substance dependence excluded except for cannabis; medication not stated.

Follow up 1 year: 12/14 (85.7%)

12 individual sessions of CBT over a maximum of 14 weeks focusing on alcohol problems only (60 mins per session) alcohol problems plus social phobia, ‘dual’ (90 mins per session). Manual guided. Conducted by clinical psychologists. Follow-up at 3 mth intervals for 9 mths after tx. Breathalyzer and collateral reports verified self-reports.

Average no. of sessions attended was 8. Both groups improved significantly from baseline on all alcohol outcome measures, with the alcohol only group significantly superior to the dual condition at 3-mth follow-up on all 3 drinking variables. Both conditions significantly improved on all social anxiety measures and BDI, with no differences between groups.

Authors state that amount of improvement on social anxiety scores was modest (around 20% from baseline scores) and average post-treatment scores indicated significant impairment. % days heavy drinking reduced from around 50% at baseline to around 12% for the alcohol condition and 25% for the dual condition.

Social phobia plus alcohol condition received more treatment and less review of homework material in order to achieve equivalent time discussing alcohol problems. Only data of the first follow up were reported.

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Physiotherapy Evidence Database (PEDro) quality rating items: (i) eligibility criteria were specified; (ii) participants allocated randomly to groups; (iii) allocation concealed; (iv) groups similar at baseline on main prognostic signs; (vii) blinding of assessors who measured at least one key outcome; (viii) adequacy of follow-up; (ix) intent-to-treat analysis; (x) between group statistical comparison of outcomes; (xi) study gives both point estimates and variability for an outcome [64]. A score of 1 = meets criteria, 0 = does not meet criteria, and ? = unclear from manuscript whether study meets criteria or not. Two PEDro items regarding blinding of subjects (item v) and blinding of treatment providers (item vi) were not scored, as blinding is not feasible in this type of psychological intervention study. Composite score from PEDro quality ratings (range = 0–9).

PE: psychoeducation.
MI: motivational interview.
SI: standard psychiatric interview.
IPT-D: interpersonal psychotherapy adapted for dysthymic disorder.
BSP: brief supportive psychotherapy.
CBT: cognitive-behavior therapy.
AUD: alcohol use disorder.
SUD: substance use disorder.
Dep: depression.
ES: effect size.
BDI: Beck Depression Inventory.
SCID: Structured Clinical Interview for DSM.
SCID-NP: Structured Clinical Interview for DSM, Non-patient Version.
SCID- 1/P: Structured Clinical Interview for DSM, Patient Version.
Mth: month.
SSRI: selective serotonin reuptake inhibitor.
Wk: weeks.
AUDIT: Alcohol Use Disorders Identification Test.
SDQ: Severity of Alcohol Dependence Questionnaire.
CDT: Carbohydrate-deficient transferring (CDT).
The quality of the studies was assessed using the validated Physiotherapy Evidence Database (PEDro) scale (Centre for Evidence-Based Physiotherapy, 2009). PEDro scores are calculated by assessing whether a study has (i) specified participant eligibility criteria; (ii) allocated participants randomly to groups; (iii) concealed allocation; (iv) used groups similar at baseline on main prognostic signs; (v) employed blinding of assessors who measured at least one key outcome; (vi) had adequate follow-ups; (vii) used intent-to-treat analysis; (viii) employed between group statistical comparison of outcomes; and (ix) given both point estimates and variability for outcomes (Centre for Evidence-Based Physiotherapy, 2009). Consistent with the recent study by Spring et al. (2009), two items regarding binding of subjects and therapists were not scored in the present review, as these were not feasible for the interventions studied. Two raters (AB and SH) independently rated the eight RCTs on the PEDro scale and reached consensus on the ratings (maximum score of 9).

3. Results

3.1. Trials of psychological interventions

Eight RCTs have reported alcohol use outcomes following manual-led psychological interventions for alcohol misuse among people with mood or anxiety disorders. These comprise two trials among samples with depression, one in a sample with dysthymia, two among inpatient samples with mixed diagnoses, one in a sample with social phobia, one in a sample with social phobia or agoraphobia and one in a sample with agoraphobia or panic disorder. Details of these studies and PEDro scores are provided in Table 1, including the percentage of each sample meeting diagnostic threshold or entry criteria on questionnaire measures.

3.2. Alcohol misuse among people with mood disorders

3.2.1. Alcohol misuse and depression

Kay-Lambkin et al. (2009) reported the results of a RCT designed to evaluate computer- versus therapist-delivered psychological treatment among 97 people with comorbid depression and substance misuse, over half of whom had alcohol misuse. All participants received an initial integrated session comprising MI and case formulation for depressive symptoms and substance use problems, followed by random assignment to one of three treatments: no further treatment (brief intervention); nine further sessions of MI and CBT delivered by a psychologist (therapist condition); or nine further sessions of MI/CBT therapy delivered by a computer (with brief 10-15 minute weekly input from a psychologist). As detailed in Table 1, all treatment conditions were associated with a significant reduction in alcohol consumption as well as symptoms of depression, with greater benefits observed among the longer treatment conditions. Conclusions that can be drawn from this study are limited by its small sample size and absence of therapy adherence and fidelity ratings.

Baker et al. (2009b) extended this work to compare the effectiveness of integrated brief intervention to single-focused (depression versus alcohol) and integrated MI/CBT among 284 people with co-occurring depression and alcohol misuse. As seen in Table 1, superior alcohol use outcomes for CBT relative to brief interventions were found, but depression and global functioning outcomes were equivalent at 18 weeks follow up. Gender differences between alcohol- and depression-focused treatments were reported, with males responding better to alcohol-focused and females better to depression-focused treatment over the short-term. Both genders responded to integrated intervention which was found to be superior to single focused treatment in terms of depression and days drinking. The authors suggested that stepped care approaches are worthy of further investigation. In stepped-care approaches, all patients receive low intensity treatment (e.g., brief integrated interventions) as a first step, progress is monitored, and patients who do not respond sufficiently are stepped-up to receive a treatment of higher intensity and/or longer duration. The lack of long-term follow-up in this study is a limitation (but is currently underway) and only partial recovery (as seen in Table 1) was achieved by many participants, indicating that a stepped care approach in which treatment is delivered until an improvement threshold is reached, may be helpful.

3.2.2. Alcohol misuse among people with dysthymia

Markowitz et al. (2008) conducted a small pilot study (N = 26) comparing 16 weeks of interpersonal psychotherapy (IPT) with 16 weeks of brief supportive psychotherapy among people with co-occurring dysthymic disorder and alcohol abuse or dependence. While depressive symptoms improved significantly within each condition at 6 months follow up, IPT achieved significantly better outcomes than brief supportive psychotherapy on this measure, with a large versus moderate effect size. Conversely, brief supportive psychotherapy and IPT had moderate and small effect sizes respectively, for the percentage of days abstinent from alcohol. Results were thus not encouraging regarding the effectiveness of either IPT or brief supportive psychotherapy for co-occurring dysthymia and alcohol misuse. There are numerous limitations to this study, including the small sample size, a high level of abstinence at baseline, high treatment dropout and the absence of longer term follow-up.

3.2.3. Alcohol misuse among mixed psychiatric inpatient samples

Hulse and Tait (2002) assessed the effectiveness of a 45-minute single session template-guided MI compared to an information package control (safer alcohol consumption patterns and normative feedback) among 120 hospitalized psychiatric patients (mainly mood and anxiety disorders) with (non-dependent) alcohol misuse. Both groups reported significant reductions in alcohol use at 6 months. The MI condition was significantly better than the information condition in terms of lowering weekly alcohol consumption, as well as the proportion of drinkers who improved. The authors concluded that brief interventions, particularly MI, are effective in reducing alcohol consumption among people with mental disorders. There were a number of limitations to this study, listed in Table 1, the most serious being the large loss to follow-up. The results reported were limited to the 69% of subjects retained at 6 months and planned analyses of the 12 month data were abandoned due to the high level of attrition (53% were followed up at 1 year).

Santa Ana et al. (2007) compared the effectiveness of a group MI consisting of two 2-hour sessions with an attention
control group condition among 101 non-psychotic inpatients (over three quarters with depression) in a psychiatric hospital. Outcomes assessed included the level of aftercare attendance and alcohol consumption at 1 month follow up. There were no differences between conditions in terms of the proportion of people attending aftercare or the rate of abstinence (50.0% for MI vs. 34.5% control). However, there were benefits of MI in terms of number of aftercare attendances, number of standard drinks consumed and fewer participants reporting binge drinking (see Table 1). The main limitations of the study were the use of one therapist (possible confounding due to therapist effects), the lack of treatment fidelity ratings as well as the alternate randomization of groups following the initial randomization. The authors concluded that the study provides preliminary evidence of the effectiveness of MI in enhancing aftercare attendance and reducing drinking.

3.3. Alcohol misuse among people with anxiety disorders

3.3.1. Alcohol misuse and social phobia

Randall et al. (2001) randomly assigned 93 people with comorbid social phobia and alcohol dependence to either 12 individual sessions of CBT focusing on alcohol or both conditions (‘dual’ condition). As described in Table 1, the latter condition received more time in therapy and less homework than the alcohol focused condition. Both conditions were associated with significant reductions in alcohol and significant, albeit modest, improvements in anxiety at 3 months post treatment. The alcohol condition was associated with better outcomes on three alcohol indices compared to the dual condition. The short-term nature of the follow-up limits the conclusions that can be drawn from the study, as it is possible that there may have been delayed improvement in the ‘dual’ condition. The authors suggested that consideration be given to the staging of treatments, rather than simply treating both disorders (Randall et al., 2001). They recommended that while it is important to treat comorbid disorders, the order in which this should be done and the degree of integration (versus adjunctive or parallel approaches) should be the subject of further study.

Schade et al. (2005) randomly assigned 96 abstinent individuals with alcohol dependence and comorbid agoraphobia or social phobia to either inpatient or outpatient treatment as usual for alcohol use, or to usual alcohol treatment plus parallel CBT for anxiety (12 weekly 60-min individual sessions) and optional pharmacotherapy (a selective serotonin reuptake inhibitor [SSRI]). The additional therapy was significantly better in terms of improving anxiety symptoms, but no difference between conditions on alcohol use outcomes were found at follow up. Limitations of the study include the inclusion of inpatients and outpatients with mixed phobias, as well as the inclusion of optional SSRIs in treatment.

3.3.2. Alcohol misuse and panic disorder/agoraphobia

Toneatto (2005) conducted a small pilot trial in which 14 people with comorbid alcohol dependence and agoraphobia were randomly assigned to either behavior therapy or cognitive therapy. Both treatments consisted of 10 individually administered sessions of cognitive therapy focused on dysfunctional cognitions mediating the alcohol and anxiety conditions, or sessions of behavior therapy focused on the treatment of alcohol dependence in the first five sessions and then anxiety for the remainder of treatment. Both interventions were equally effective in reducing drinking and anxiety symptoms at 12 months follow up. Interestingly, anxiety symptoms significantly improved during the five alcohol-focused sessions of the behavior therapy condition, leading Toneatto (2005) to conclude that brief behavior therapy might be an effective treatment for this specific comorbidity. Although this study was limited by its small sample size and reliance on self-report measures, the integrated nature of the treatments (addressing both alcohol and anxiety problems) and the initial focus on alcohol in the behavioral condition supports a staged approach.

3.3.3. Comparison of effect sizes for changes in alcohol use and depression/anxiety symptoms immediately following treatment

Hulse and Tait (2002) did not measure outcome variables immediately after treatment and were excluded from the analysis. The seven remaining studies for alcohol use outcomes are compared in Fig. 2. All conditions demonstrate standardized mean differences in the expected direction (decrease for occasions of use/average number of drinking days/heavy drinking days and increase in percentage days abstinent following treatment). Several conditions resulted in large changes of at least one standard deviation, including the therapist-delivered MI/CBT for people with depression (Kay-Lambkin et al., 2009), group MI for mixed psychiatric samples (Santa Ana et al., 2007), parallel CBT for alcohol and anxiety (Schade et al., 2005) and targeted alcohol focused CBT (Randall et al., 2001) for people with anxiety disorders. These large changes in alcohol outcome were found despite the likelihood of the presented effect sizes being underestimates of the true population effect size. Most other treatment conditions generated approximately half a standard deviation of change, including the brief interventions. Standardized mean differences for depression and anxiety severity scores, when reported, are compared in Fig. 3. There were large decreases of over one standard deviation in depression severity scores in several studies. Decreases in anxiety severity scores were smaller, although tended to show decreases in similar magnitude to the alcohol use variables.

3.3.4. Limitations of psychological intervention trials

PEDro scale scores ranged from 5 to a maximum of 9 for the studies analyzed, with the most common limitations (4/8 studies) being: failure to obtain more than 85% of subjects initially allocated to groups at follow-up; lack of intention to treat analysis (3/8 studies); lack of clarity regarding concealment of allocation (3/8 studies); and dissimilar baseline characteristics (3/8 studies). In addition, as Table 1 shows, the studies suffered from a number of other methodological limitations including: short-term follow-up (4/8 studies); recruitment of heterogeneous samples with different mental disorders (3/8 studies, one of which recruited both inpatients and outpatients); reliance on self-reported alcohol consumption (3/8 studies); and small sample sizes (2/8 studies). Among the mood studies, there was variability in the use of diagnostic interviews versus symptom severity ratings with diagnostic cut-off scores to determine eligibility for inclusion in the study. While the anxiety studies all included diagnostic assessments of both anxiety and alcohol misuse, samples included mixed anxiety diagnoses. Nevertheless, the eight RCTs reviewed above
provide unique information about people with comorbid mood/anxiety disorders and alcohol misuse and the effects of manual guided treatment.

3.4. Summary of findings of psychological intervention trials and suggestions for further research

3.4.1. Alcohol misuse and depressive disorders

Overall, two studies suggest that co-occurring depression and alcohol misuse are responsive to psychological treatment, including brief integrated MI interventions and longer duration CBT of up to ten sessions (Baker et al., 2009b; Kay-Lambkin et al., 2009). Additional benefits of the longer over brief integrated interventions were seen on both depression and alcohol outcomes, with both studies suggesting that stepped care is worthy of further investigation. When stepping up to a longer intervention, integrated CBT interventions appear to be suitable for both men and women (Baker et al., 2009b) and can be delivered effectively by a therapist or a computer (Kay-Lambkin et al., 2009). IPT and brief supportive psychotherapy, based on the results of one study, are yet to demonstrate effectiveness in both mood and alcohol use domains. The brief integrated MI intervention and CBT in the trials conducted by Kay-Lambkin et al. (2009) and Baker et al. (2009b) were delivered by psychologists in research clinics, and further research is required to determine if these interventions can effectively be translated into practice in real world clinical settings. Heather (1995; 1996) has pointed out that the effectiveness of brief interventions among treatment seekers, often delivered by counselors, may not generalize to non-treatment seekers who may receive brief interventions in a general health care setting. In addition, as the sample included in Kay-Lambkin et al.’s (2009) study comprised of cannabis users as well as problem drinkers, a direct comparison of brief integrated intervention and computer therapy among participants with comorbid depression and alcohol misuse is required.
Individual (Hulse and Tait, 2002) and group (Santa Ana et al., 2007) MI among psychiatric hospital inpatients, primarily with depression, have been shown to be effective in reducing alcohol consumption at follow-up. However, the results were modest in the study by Hulse and Tait (2002) and replication is needed. It is possible that inclusion of nurses as therapists may have weakened the results and further investigation of the influence of therapist characteristics in the effectiveness of MI in psychiatric settings is warranted. The Santa Ana et al. (2007) study had good outcomes with the inclusion of inpatients with alcohol dependence, suggesting that the exclusion of inpatients with alcohol dependence in the study by Hulse and Tait (2002) is not indicated and indeed, may have resulted in a floor effect (i.e., reduced the likelihood of potentially greater improvements in drinking being observed).

3.4.2. Alcohol misuse and anxiety disorders

As with comorbid depression and alcohol misuse, existing studies suggest that co-occurring anxiety disorders and alcohol misuse are responsive to psychological treatment, including brief behavioral interventions focusing on alcohol (Toneatto, 2005). Two of the three studies recommended a stepped or staged approach to treatment (Randall et al., 2001; Toneatto, 2005), indicating a need for future studies on stepped care. While the study by Schade et al. (2005) found a significant reduction in anxiety symptoms among a mixed sample of participants with social phobia and agoraphobia, the level of anxiety reduction in the social phobia group was modest in comparison to studies comprised mostly of participants with agoraphobia (Schade et al., 2005; Toneatto, 2005). This suggests that replication of these studies with larger unmixed samples of subjects is needed. It is possible that different anxiety disorders respond differentially to alcohol- versus anxiety-focused or integrated interventions. As no studies have yet compared the effectiveness of anxiety, alcohol and integrated focused interventions, research targeting groups with specific anxiety disorders would clearly be informative.

Such studies could potentially allow an evaluation of a stepped approach to further intervention among those who require treatment in the anxiety and/or alcohol domain. The possibility of gender differences in treatment outcomes among individuals...
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References
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