The effect of brief interventions for alcohol among people with comorbid mental health conditions: a systematic review of randomised trials and narrative synthesis

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Abstract

Aims

To review the evidence on the effect of brief interventions (BI) for alcohol among adults with risky alcohol consumption and co-morbid mental health conditions.

Methods

A systematic review of randomised controlled trials (RCTs) published before May 2016 was undertaken and reported according to PRISMA guidelines. The findings were combined in a narrative synthesis. The risk of bias was assessed for included trials.

Results

17 RCTs were included in the review and narrative synthesis: 11 in common mental health problems, and 6 in severe mental illness. There was considerable heterogeneity in study populations, BI delivery mode and intensity, outcome measures and risk of bias. Where BI was compared with a minimally active control, BI was associated with a significant reduction in alcohol consumption in four out of nine RCTs in common mental disorders and two out of five RCTs in severe mental illness. Where BI was compared with active comparator groups (such as motivational interviewing or cognitive behavioural therapy), findings were also mixed. Differences in the findings may be partly due to differences in study design, such as the intensity of BI and possibly the risk of bias.

Conclusions

Overall, the evidence is mixed regarding the effects of alcohol BI in participants with comorbid mental health conditions. Future well-designed research is required to answer this question more definitively.

(250 word limit – currently 218)

Introduction

Alcohol use disorders (AUD) and mental health conditions represent a large disease burden and frequently co-occur. Estimates of co-prevalence of AUD and mental health conditions in England from the Adult Psychiatric Morbidity Survey (APMS) 2014 show 13.2% of adults with probable alcohol dependence (Alcohol Use Disorders Identification Test (AUDIT) score 20+ (Babor et al., 2001)) and 10.7% of adults with harmful drinking or probable dependence (AUDIT score 16-19) are receiving counselling or therapy for a mental or emotional problem, compared with 2.5% of low risk drinkers (AUDIT score 0-7) and 3.2% of hazardous drinkers (AUDIT score 8-15) (NHS Digital, 2016). In addition, 25.3% of adults with probable alcohol dependence take medication for a mental health condition compared with 10.3% of low risk drinkers (NHS Digital, 2016). Comorbidity is an issue with relevance beyond mental health and substance use treatment: in primary care a quarter of alcohol dependent patients had co-morbid anxiety or depression (England and Scotland) (Coste et al., 2016), and 21% men and 10% women with schizophrenia were drinking at harmful levels (>50/35 units per week for men and women respectively) (UK) (Khadjesari et al., 2016).

Effective treatments for patients with comorbid AUD and mental health conditions are needed; systematic reviews have found evidence of worse depression treatment outcomes in patients with AUDs (Sullivan et al., 2005), and also worse alcohol treatment outcomes in patients with mental health comorbidity (Adamson et al., 2009). Alcohol screening and brief intervention (BI) is an efficacious intervention, comprising one to four sessions of "engagement with a patient and the provision of information and advice that is designed to achieve a reduction in risky alcohol consumption or alcohol-related problems" (Kaner et al., 2007, p. 4). However most research has been conducted in primary care and emergency departments, and the National Institute for Health and Care Excellence (NICE) in the UK has recommended mental health settings for future research on alcohol BI (NICE, 2010). Previous systematic reviews of interventions in people with comorbid mental health conditions have either studied misuse of different substances together (Hunt et al., 2013; Kaner et al., 2011), focused

on a particular mental health condition (e.g. psychosis (Baker et al., 2012)), or studied all types of psychological interventions rather than focusing on BI (Baker et al., 2012; Riper et al., 2014). One previous review which focussed on BI studied substance use interventions in comorbid physical and mental health conditions, and found reductions were seen in trials with physical health comorbidities (3 trials), but for mental health and dual substance use the evidence was equivocal (8 and 3 studies respectively) (Kaner et al., 2011). Searches for this review were conducted for 1999-2009 (Kaner et al., 2011), and a number of trials have been published since. This review investigated the effects of alcohol BI in adults with co-morbid mental health conditions, synthesising evidence from randomised controlled trials in a narrative synthesis.

Method

Cochrane guidance on systematic review methodology was followed and PRISMA guidelines were used in reporting this study. Ethical approval was not required.

Search strategy

MEDLINE, PsycINFO and EMBASE were searched through Ovid from inception until 25th May 2016. Search results were limited to English language only papers. 'RCT only' and 'human participant only' filters were applied to the search. The Cochrane Central Register of Controlled Trials was also searched. Reference lists of included papers were hand-searched. In order to minimise publication bias, unpublished literature was identified through a search for theses through the ProQuest database.

The search terms were selected by the research team to reflect a broad spectrum of mental health conditions and included relevant search terms from published systematic reviews (Baker et al., 2012; Baker et al., 2012; Kaner et al., 2009). Terms were searched as keywords or using medical subject headings (MeSH) terms where possible. The search terms used in the Ovid database were:

("*Mental Health*" OR "*Affective Disorder*" OR "*Agoraphobia*" OR "*Anxiety*" OR "*Bipolar Disorder$"* OR "*Borderline Personality Disorder$"* OR "*Depression*" OR "*Dissociative Disorder$"* OR "*Dysthymia*" OR "*Eating Disorder$"* OR "*Obsessive Compulsive Disorder*" OR "*Panic Disorder$*" OR "*Post-Traumatic Stress Disorder*" OR "*Psychosis*" OR "*Psychotic Disorder*" OR "*Schizophrenia*" OR "*Seasonal Affective Disorder$"* OR "*Stress*")

AND

("*Alcohol Treatment*" OR "*Alcohol*")

AND

("*Brief Counselling*" OR "*Brief Counseling*" OR "*Brief Intervention*" OR "*Brief Advice*" OR "*Minimal Intervention*" OR "*Screening*").

For Cochrane and ProQuest, titles, abstracts and keywords were searched using the following terms: "alcohol treatment" OR "brief intervention" AND "mental health".

Inclusion criteria

Studies were eligible for inclusion if: (i) A randomised controlled trial with two or more intervention arms was reported. (ii) Participants were aged 16 or above and were experiencing both a mental health condition and identified as drinking alcohol at risky levels, but were not seeking alcohol treatment. (iii) Settings included any mental health treatment settings (e.g. inpatient, outpatient or community), or other health or social care setting where screening for mental health and alcohol use took place e.g. GP surgery or counselling centre. Studies in alcohol treatment settings were excluded. (iv) The alcohol intervention was a brief intervention or brief advice aimed at reducing alcohol consumption of up to 4 sessions (Kaner et al., 2007), 'integrated' interventions targeting alcohol and mental health together were excluded in order to investigate only the direct effect of BI on alcohol consumption. (v) Comparator group that was either a minimally active control group (e.g. assessment

only) or an active intervention (e.g. MI/CBT). (vi) Outcomes reported related to alcohol consumption measured by self-report, including quantity or frequency measures, or composite scores from validated questionnaires such as the AUDIT (Babor et al., 2001).

Data selection

All search results were exported into EndNote X7, with the exception of ProQuest, where the search results were screened online. Abstracts from all studies identified were screened independently by two reviewers (IML, plus either SB or ZK). Disparities between two reviewers on the appropriateness of a trial for inclusion were settled by a third reviewer. For potentially relevant studies, full articles were downloaded, reviewed and assessed for eligibility against the inclusion criteria. Information on the sample, mental health condition, brief intervention, comparator group and the trial findings was extracted from studies which met the inclusion criteria into a data extraction table in Microsoft Excel by IML and cross-checked for accuracy and detail by RC.

Risk of bias

The risk of bias in studies included in this review was assessed using the Cochrane Collaboration's Risk of Bias Assessment Tool (Higgins et al., 2011). The assessment of bias was conducted independently by two reviewers (IML and RC). Risk of bias was assessed for sequence generation, allocation concealment, blinding of researchers to experimental group, blinding of outcome assessment, incomplete outcome data, selective outcome reporting and 'other issues' from each study. These criteria were then categorised as 'low', 'high' or 'unclear' for each study. Studies were not assessed for blinding of participants and health professionals, as this is not possible for this type of intervention. A summary assessment of the risk of bias in each study was derived using a simple approach recommended in the Cochrane handbook: low risk of bias = low risk of bias for all key domains, unclear risk of bias = unclear risk of bias for one or more key domains, high risk of bias = high risk of bias for

one or more key domains (The Cochrane Collaboration, 2011). Additionally, risk of publication bias was managed by searching unpublished literature in the form of a thesis search.

Narrative synthesis of study findings

Due to the variation in the studies identified for inclusion, in terms of population, intervention, comparator group and outcome variables, a meta-analysis was not feasible for this review. The outcome measures varied across trials, meaning conversion to a common outcome was not possible. A pooled estimate would also not have been useful due to the clinical and methodological differences between trials such as the clinically diverse populations and because some included studies were at risk of bias. The findings of studies were synthesised narratively at two subgroup levels. Firstly, the findings of studies of patients with common mental health problems were presented separately to those of patients with severe mental illnesses such as psychosis and schizophrenia, as these patients follow different treatment pathways (NICE, 2014, 2011). Secondly, within each of these patient groups, findings were synthesised according to the trial comparator group, i.e. BI vs. minimally active comparator group or BI vs. active comparator group. This was because BI was hypothesised to reduce alcohol consumption to a greater extent than control groups, but are not hypothesised to be superior to more intensive psychological interventions such as MI or CBT. Under these subgroups, the findings were then grouped by those reporting consistent findings, i.e. significant difference or not. Where studies reported consistent findings, we looked for similarities between them in terms of setting, nature of intervention and outcome measures used. Risk of bias is indicated in the tables; due to the small number of studies included in the review we did not exclude those at high risk of bias from the synthesis.

Results

Characteristics of included studies

In total, 3,069 records were screened. The full text of 49 articles was downloaded. Of these, 32 articles were excluded and 17 (reporting on 17 trials) were identified for inclusion in the systematic review and the narrative synthesis. Included trials were published between 2002 and 2015, and were conducted in the USA (10 trials), Australia (2 trials), Sweden (2 trials), UK, Norway and Germany (1 trial each). The sample size of the trials ranged from 29 (Wilson et al., 2014) to 497 (Ryb et al., 2011) participants. Overall, the majority of trials examined a face-to-face BI (11 trials), with fewer trials delivering brief intervention through web, phone, or blended methods (two trials each). A single session BI was most common (13 trials), with four trials using a multiple session intervention. Most trials compared BI to a minimally active comparator (14 trials) which was most commonly providing basic information, however 3 trials compared BI to an active comparator.

[Figure 1 PRISMA flow diagram to go here]

a) Common mental health problems

Eleven trials have investigated alcohol BI in people with common mental health problems (including anxiety, depression, post-traumatic stress disorder, and social phobia). Of these, three trials were classified as having a low risk of bias (Geisner et al., 2015; Grothues et al., 2008; Wilson et al., 2014), two were classified as having a high risk of bias (Lynnette, 2013; Terlecki et al., 2011), and six were unclear (LaBrie et al., 2015; Monahan et al., 2013; Montag et al., 2014; Penberthy et al., 2013; Ryb et al., 2011; Satre et al., 2013). Of the 11 trials in people with common mental health problems, only three trials took place in a mental health treatment setting (LaBrie et al., 2015; Lynnette, 2013; Satre et al., 2013). The remaining 8 trials recruited participants from other health-seeking populations or health records (Grothues et al., 2008; Montag et al., 2014; Ryb et al., 2011; Wilson et al., 2014), from the community or from universities (Geisner et al., 2015; Monahan et al., 2013; Penberthy et al., 2013; Terlecki et al., 2011). Demographic characteristics of participants are shown in Table 1.

The majority of trials studied a single session BI (9 trials), with only two trials studying BI with multiple sessions (Grothues et al., 2008; Satre et al., 2013). The BI was delivered face-to-face in six trials (LaBrie et al., 2015; Lynnette, 2013; Penberthy et al., 2013; Ryb et al., 2011; Terlecki et al., 2011; Wilson et al., 2014), web-based in two studies (Geisner et al., 2015; Montag et al., 2014), by telephone in one study (Grothues et al., 2008), or a combination of methods in two studies (C. Monahan et al., 2013; Satre et al., 2013). Nine of the 11 trials had a minimally active comparator such as assessment and feedback only (Geisner et al., 2015; Grothues et al., 2008; LaBrie et al., 2015; Lynnette, 2013; Montag et al., 2014; Ryb et al., 2011; Satre et al., 2013; Terlecki et al., 2011; Wilson et al., 2014), with two comparing BI to an active comparator such as multiple sessions of MI/CBT (Monahan et al., 2013; Penberthy et al., 2013). These groups are reported separately in the narrative synthesis. The primary outcome measures used in the different trials were variable and included quantity measures such as grams of alcohol consumed per day (for example in (Grothues et al., 2008)) and screening or clinical assessment tools such as AUDIT (for example in (Terlecki et al., 2011)), with many studies measuring multiple outcomes.

[Table 1 Common Mental Health Problems to go here]

b) Severe mental illness

Six trials have investigated alcohol BI in people with severe mental illness (mainly psychosis and schizophrenia). One of these trials was classified as having a high risk of bias (Graeber et al., 2003), and the risk of bias was unclear for the remaining five trials (Bagøien et al., 2013; Baker et al., 2002; Eberhard et al., 2009; Hulse and Tait, 2002; Nehlin et al., 2012). Of the six trials in people with severe mental illness, two were conducted among inpatients (Baker et al., 2002; Hulse and Tait, 2002), two among outpatients (Eberhard et al., 2009; Nehlin et al., 2012), and one trial each among psychiatric emergency departments (Bagøien et al., 2013) and a combination of inpatients and outpatients (Graeber et al., 2003). Demographic characteristics of participants are shown in Table 2.

Four of the trials studied a single session BI (Baker et al., 2002; Eberhard et al., 2009; Hulse and Tait, 2002; Nehlin et al., 2012) and two used a multiple session BI (Bagøien et al., 2013; Graeber et al., 2003). In contrast to the trials in common mental health problems, the majority of trials in severe mental illness used a face-to-face BI (Bagøien et al., 2013; Baker et al., 2002; Graeber et al., 2003; Hulse and Tait, 2002; Nehlin et al., 2012), with one trial using a telephone BI (Eberhard et al., 2009). Four of the six trials had a minimally active comparator (Bagøien et al., 2013; Eberhard et al., 2009; Hulse and Tait, 2002; Nehlin et al., 2012), and two compared BI to an active comparator (Baker et al., 2002; Graeber et al., 2003). These groups are reported separately in the narrative synthesis. As with the trials in participants with common mental health problems, the primary outcome measures were variable and included quantity measures (for example in (Hulse and Tait, 2002)), frequency measures such as drinking days (for example in (Graeber et al., 2003)), and clinical assessment tools such as AUDIT (for example in (Eberhard et al., 2009)).

[Table 2 Severe Mental Illness to go here]

Narrative synthesis of study findings

a) Common mental health problems

(i) Brief Intervention vs. Minimally Active Comparator

There were nine trials of alcohol BI in participants with common mental health problems with a minimally active comparator. Of these, four found a significant difference between BI and the control group at follow-up (Lynnette, 2013; Terlecki et al., 2011; Montag et al., 2014; Satre et al., 2013). Two of the positive trials were conducted among college students using the Brief Alcohol Screening and Intervention of College Students (BASICS) model for the BI and measured drinks per week as a primary outcome (Lynnette, 2013; Terlecki et al., 2011), however these two trials were assessed as having a high risk of bias. One trial of a web-based BI among women with depression also found a significant reduction in drinks per week ($P<0.001$) (Montag et al., 2014), and one trial of a face-to-face BI with

telephone booster sessions found a borderline significant reduction in hazardous drinking at 3-month follow-up (P=0.043) (Satre et al., 2013). The remaining five studies found no significant difference between the BI group and control (Geisner et al., 2015; Grothues et al., 2008; LaBrie et al., 2015; Penberthy et al., 2013; Ryb et al., 2011; Wilson et al., 2014). There was no evident relationship between BI delivery mode, recurrence or duration and whether or not the trial had significant findings.

(ii) Brief Intervention vs. Active Comparator

There were two trials of alcohol BI in participants with common mental health problems that had an active comparator group. Of these, neither trial found a significant difference in alcohol measures between the BI and comparator groups of a computer intervention (Monahan et al., 2013), or a video intervention or brochure (Penberthy et al., 2013).

b) Severe mental illness

(i) Brief Intervention vs. Minimally Active Comparator

There were five trials of alcohol BI in participants with severe mental illness with a minimally active comparator. Of these, two trials found a significant difference between the BI group and the control group at follow-up. One trial found a difference between groups in the frequency of alcohol consumption of 4.7 days per month (95% CI 0.4-9.0) at 24-month follow-up (Bagøien et al., 2013), and one trial found a significant difference in AUDIT scores at 6-month follow-up (P<0.001) (Eberhard et al., 2009). Three trials did not identify any significant difference between the BI group and the control group (Baker et al., 2002; Hulse and Tait, 2002; Nehlin et al., 2012). As with the trials conducted among participants with common mental health problems, there was no evident relationship between the BI delivery mode, recurrence or duration and whether or not the trial had significant findings.

(ii) Brief Intervention vs. Active Comparator

There was one trial of alcohol BI in participants with severe mental illness with an active comparator. This trial compared a BI (3 sessions of MI) with a 3-session educational and CBT intervention and found the MI group had significantly more participants who were abstinent (P<.008) and significantly fewer drinking days at 8-week (P<0.006) and 24-week (P<0.008) follow-up, but no difference in weekly alcohol consumption or peak blood alcohol concentration (BAC) (Graeber et al., 2003). However this trial was assessed as having a high risk of bias.

Discussion

Summary of findings

In this systematic review and narrative synthesis of RCTs of alcohol BI among participants with comorbid mental health conditions, we identified 11 trials in people with common mental health problems and a further six trials in people with severe mental illness. There was considerable heterogeneity between trials in the study populations, BI delivery mode and intensity, and outcome measures, meaning a meta-analysis was not possible and a narrative synthesis was most appropriate. Overall, the evidence is mixed regarding the effects of alcohol BI in participants with comorbid mental health conditions. For common mental health problems, four out of nine trials identified reductions in measures of alcohol consumption or misuse in the BI arm that were significantly greater than the minimally active control group. The majority of trials in common mental health problems used a single session BI. For severe mental illness, fewer trials were identified, but again less than half of the trials (two out of five) found a significant difference between the BI arm and the minimally active control. Among these trials there was a more even split between single and multiple-session BI. Only a small number of trials compared BI with an active comparator group: two for common mental health conditions and one for severe mental illness.

Comparison of findings with previous literature

This is the first systematic review to focus solely on the effects of BI for alcohol among people with comorbid mental health conditions. Previous systematic reviews tend to focus on a broader range of psychological interventions for people with comorbid alcohol misuse and common mental health problems, which makes it difficult to compare our findings with the previous literature. One review found that MI/CBT and BI for alcohol led to reductions in depressive and anxiety symptoms, with longer and more intensive interventions producing better outcomes (Baker et al., 2012). A further systematic review on using MI/CBT to treat comorbid AUD and depression together found a small but clinically significant effect (Riper et al., 2014). Previous reviews have typically studied a wider range of interventions and suggested that more intensive interventions (e.g. 10 sessions of MI/CBT) were more effective (Baker et al., 2012; Riper et al., 2014). Previous reviews have focussed on clinical populations, whereas the trials we identified in common mental health problems were conducted mainly in non-clinical or non treatment-seeking populations. The difference in efficacy of BI between help seeking and non help-seeking populations is well established (Moyer et al., 2002) and could explain why BI was not often associated with a reduction in alcohol consumption compared with the control group in these trials.

Regarding severe mental illness, again it is difficult to compare our findings with previous reviews as they encompass a broader range of psychological interventions. One systematic review found psychological interventions were effective in reducing alcohol consumption among people with psychosis, and that BI was as effective as longer interventions (Baker et al., 2012). However, longer psychological interventions (e.g. 10 sessions) were associated with wider benefits in mental health and functioning (Baker et al., 2012). There is also a Cochrane review of psychological interventions for substance misuse (including but not limited to alcohol) among people with severe mental illness which found there was no consistent evidence to support any psychological intervention over usual care, and highlighted the lack of robust research in this field (Hunt et al., 2013). Our findings echo this with none of these trials classified as having a 'low' risk of bias.

Finally, while the findings of this review lend only modest support for BI, the relationship between research participation and behaviour change is complex. In several of the trials, although there was no significant main effect of the intervention, both the intervention and the minimally-active control groups reduced their alcohol consumption at follow-up. This has been observed previously in many trials of alcohol BI, and it has been suggested that just completing a research interview may be enough to lead to behaviour change, which may underestimate the effect of BI (McCambridge and Kypri, 2011).

Strengths and Limitations

One of the strengths of this systematic review is its robust methodology, with a systematic search for published and unpublished literature, *a priori* eligibility criteria, study identification and data extraction conducted independently by two reviewers, critical appraisal of included studies and suitable synthesis of the results given the heterogeneity of the data. We had broad inclusion criteria for the mental health condition and alcohol outcome measures to capture as much relevant literature as possible. Nevertheless, further efforts to identify unpublished literature could have been made by searching a grey literature database for conference abstracts and contacting authors for further information.

Despite the broad approach in identifying trials conducted among participants with any mental health condition, we only identified just 17 eligible trials. There were important differences in the BI recurrence and delivery mode, alcohol measures, and comparator group, which limited the extent to which the findings could be synthesised. The review would also have benefited from an assessment of the extent to which trials explore the efficacy of brief interventions as opposed to their effectiveness, such as application of the RITES tool which is intended for retrospective assessment of studies included in systematic reviews (Wieland et al., 2017), as difference in context is thought to impact on findings (Heather, 2014). Our review focussed on alcohol consumption outcomes, as opposed to alcohol-related harm or mental health outcomes, which of course are also important

outcomes to consider but were beyond the scope of this review. Mental health measures were included as secondary outcomes in some of the trials included in this review. However we did not examine these as we are aware of other trials (not included in this review, as our focus was on alcohol brief interventions) that have used an integrated BI targeting both alcohol and mental health (for example (Baker et al., 2010, 2014; Kay-Lambkin et al., 2009), which would be of importance in assessing the effectiveness of BI on mental health. Future research could address this topic. Finally, it is notable that all the three trials assessed as having a high risk of bias had significant findings (Graeber et al., 2003; Lynnette, 2013; Terlecki et al., 2011), whereas none of the trials assessed as having a low risk of bias had significant findings.

Implications for practice and future research

The findings of this review were mixed, and we were unable to identify any patterns between BI delivery mode, recurrence or duration and whether or not the trial had positive findings. The current evidence, therefore, does not support the routine implementation of alcohol BI for patients with mental health conditions in practice. However comorbidity is receiving increased attention in the NHS in England and was discussed in the Five Year Forward View for Mental Health (Independent Mental Health Taskforce to the NHS in England, 2016). Comorbidity is recognised by the NICE, with recent guidance issued on co-existing severe mental illness and substance misuse for community health and social care services, which recommended a collaborative multi-agency approach (NICE, 2016). In 2017 a new Commissioning for Quality and Innovation payments framework for undertaking screening and brief advice for alcohol was also introduced, with mental health providers among those included (NHS England, 2017). We identified variation in the risk of bias of included trials, and further high quality trials that are adequately powered to detect a small but clinically relevant reduction in alcohol misuse would be of value. Future reviews could examine the effect of brief interventions on mental health in this population, and future studies should develop and evaluate focussed or integrated interventions for this group. The majority of research into alcohol BI in people with comorbid mental health

conditions has also been conducted in the USA, and further trials elsewhere are warranted to see if the findings differ in other health care systems. Finally, a core outcome set for alcohol brief intervention trials would prompt researchers to use the same outcomes, enabling the synthesis of studies in a meta-analysis.

Conclusion

This is the first systematic review that has focussed solely on the effects of alcohol BI in participants with a range of comorbid mental health conditions. Our narrative synthesis of 17 trials suggests that the evidence is mixed. For common mental health problems, where most trials used a single session BI, four out of the nine trials identified reductions in measures of alcohol consumption or misuse in the BI arm that were significantly different from the control group. For severe mental illness, there was more variety in the intensity of BI used, with again less than half of the trials (two out of five) finding a significant difference between the BI arm and the control. Interventions should be developed and evaluated using robust trial methodology to address some of the limitations identified, in order to improve outcomes for this population.

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Conflict of interest

None declared.

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Table 1: Characteristics of trials of alcohol BI among participants with comorbid common mental health problems

Study Reference	Country	Sample size	Gender	Mean Age (S.D.)	Ethnicity	Mental Health Condition	Brief Intervention	Comparator	Key Findings	Risk of Bias
Brief Intervention vs. Minimally Active Comparator										
Geisner 2015 (Geisner et al., 2015)	USA	N=85 Assessment only; N=85 Integrated intervention; N=85 Mood intervention condition; N=84 Alcohol intervention condition.	62% female	20.14 years (SD=1.34)	60% white 19% Asian or Pacific Islander 8% multiracial 8% Hispanic 1% Black or African American 1% Native American	Depression	Web-based personalised feedback on drinking and comparison of individuals drinking to the norms for that group (participants randomly allocated to alcohol only intervention, depressed mood only intervention or integrated intervention)	Assessment only and treatment resource information for depression and substance use, but no personalised feedback or intervention materials.	Primary Outcome Measures: depression, typical weekly drinking, alcohol consequences (RAPI) Both groups improved but no significant differences between BI and control for typical weekly drinking (F=1.51, p=.54) or alcohol consequences (F=1.51, p=0.28).	Low

Grothues 2008 (Grothues et al., 2008)	Germany	N=139 Control, N=131 Fixed care, N=138 Stepped care	32% female	36.9 years (SD=13.44)	Not reported	Depression/Anxiety (General Practice Patients)	2 x intervention groups: 1) Fixed Care (FC) 4 x BI sessions at baseline and months 1,3,6. All sessions 30 minutes 2) Stepped Care (SC) 3X BI sessions at months 1, 3, 6 depending on the success of the previous interventions. All sessions 30-40 minutes. All sessions were conducted over the phone and were based on MI principles and structured using elements of behavioural change counselling	Booklet on health behaviour	Primary Outcome Measure: alcohol consumption (g/alcohol per day) BI was significantly related to reduction of drinking in non-comorbid participants (those without comorbid anxiety or depression) (-2.64g/alcohol vs -8.61g/alcohol; p=.03), however BI did not significantly effect a reduction of drinking in comorbid patients (−22.06 g/alcohol vs. −22.09 g/alcohol; p = 0.76).	Low

LaBrie 2015 (LaBrie et al., 2015)	USA	N=279; Distribution between groups not reported	70% female	19.98 years (SD=1.22)	68% White 21% Hispanic 14% Multiracial 6% Other 6% Asian 3% African American 1% Native Hawaiian/ Pacific Islander 1% American Indian/Alaskan Native	Students accessing mental health service	1x30 minute session of cognitive behavioural skills training with personalised feedback, using MI approach	1x30 minute control session comprising educational information about diet and exercise	Primary Outcome Measures: Alcohol consumption, alcohol-related consequences, protective behavioural strategies and mental health. Significant reduction in drinks per week for both conditions from baseline to 1 month and baseline to 6 month ($p<.001$), and significant reduction in maximum drinks consumed in one session across time in both conditions ($p<0.001$). However neither result was significantly different for the BI condition compared with control.	Unclear
Lynnette 2012 (Lynnette, 2013)	USA	N=15 Brief intervention; N=20 Control	54 % female	21 years (SD=2.0)	74% White 9% Asian/Pacific Islander	Contact with college counselling service	One session of personalised discussion and feedback about alcohol use (average completion time 46 minutes)	Information only control group – received pamphlet only	Primary Outcome measures: peak BAC, average number of drinks per week and drinking days. Participants assigned to the brief	High

					3% African American 9% Hispanic 6% Other				intervention consumed significantly fewer drinks per week (M = 10.83, SD = 9.27) compared to participants in the control (M = 16.25, SD = 11.93) at the 1-month follow-up (F[1,21] = 7.01, p = 0.02, d = .76)	
Montag 2015 (Montag et al., 2014)	USA	N=234; Distribution between groups not reported	100% female	Not depressed group: 28 years (SD=0.6) Depressed group: 29 years (SD=0.8)	100% American Indian/ Alaskan Native	Depression in women attending health clinics (not all participants were depressed but subsample of depressed women was analysed as part of the trial)	Completion of web-based survey providing personalised web-based feedback	TAU (not described)	Primary Outcome Measure: drinks per week Significant time effect (p<.001) but no intervention effect (treatment x time; p=.127) for change in number of drinks per week. When results were stratified by depression, there was a significant treatment x time effect only among depressed women (p<.001)	Unclear

Ryb 2010 (Ryb et al., 2011)	USA	Total N=497 N=250 PMI; N=247 Control.	16% female	34 years (SD not reported)	67% White (other ethnicities not reported)	Trauma centre	Personalised motivational intervention, 15-20-minute session of motivational interviewing style principles, followed by a personalised feedback letter	Brief information and advice regarding drinking and risk for future injury, advised to reduce drinking	Primary Outcome Measure: differences in drinking quantity and binge episode frequency. A statistically significant decrease in consumption and binge frequency was found for each grouping ($p<0.001$), however no significant differences between groups.	Unclear
Satre 2013 (Satre et al., 2013)	USA	Total N=104 N=52 Brief Intervention; N=52 Control	64% female	42.4 years (SD=13.7)	83% White 10% Mixed/Other 6% Black 2% Asian American	Depression	One 45-minute session, using MI techniques, followed by two 15-minute booster telephone sessions	Pamphlet guidance on risks associated with substance use and risks specific to the substances they reported delivered during a 5-minute session	Primary Outcome Measure: 3+ reported drinking days and hazardous drinking in the previous 30 days. MI participants were less likely than controls to report hazardous drinking at 3 months (60.0 vs 81.8%, p=.043)	Unclear
Terlecki 2011 (Terlecki et al., 2011)	USA	Total N=70 N= 38 Brief Interventi	33% female	20.55 years (SD=1.59)	86% White (other ethnicities not reported)	Social Phobia	50 minute baseline assessment followed by BASICS intervention which consists of 50-minute session, including personalised	50 minute baseline assessment only	Primary Outcome Measures: Alcohol Use Disorders Identification Test, Alcohol consumption, Rutgers Alcohol	High

		on; N= 32 Control					feedback, using MI principles		Problem Index, The Social Phobia Scale, The Spielberger Trait Anxiety Inventory Significant decline in weekly alcohol consumption (P=0.01) and alcohol problems (p<0.001) in the BI condition, compared to the comparison condition at 4-week follow-up	
Wilson 2014 (Wilson et al., 2014)	UK	N=12 Brief Intervention; N=17 Control	40% female	54 years (SD=14.5)	Not reported	Depression in General Practice	A leaflet on depression, and 5 minutes of structured advice on alcohol consumption, including a normative comparison of participants drinking to their peers	The control group consisted of those with depression or high blood pressure. Group with depression given a leaflet on depression and TAU	Primary Outcome: AUDIT score Mean change in the intervention arm was -3.1 on the AUDIT compared with -1.5 in the control arm (not significant due to small sample size of pilot trial)	Low
Brief intervention vs. active comparator										

Monahan 2013 (Monahan et al., 2013)	USA	Total n=207 college students Study 1) N=38 Brief Intervention; N=35 Control. Study 2) N=46 Brief Intervention; N=45 Computerised intervention; N=42 Control	53% women	19.50 years (SD=1.99)	68% White 28% Black or African American 3% Hispanic or Latino 1% Asian 2% American Indian or Alaska Native	Post-traumatic stress symptoms in college students	50 minute clinician delivered brief motivational intervention N.B. combined data from two trials	1) Interactive CD-ROM which involves a virtual bar, and contains information on drinking risks etc or computerised web-based intervention providing personalised feedback 2) Assessment only	Primary Outcome Measure: Daily Drinking Questionnaire (DDQ) to assess consumption. Both groups improved but there were no significant differences between groups regarding alcohol consumption on the DDQ. A significant reduction in alcohol related consequences was found in the BI group ($t(12)=3.76$, $p=0.003$; $d=-1.11$)	Unclear
Penberthy 2013 (Penberthy et al., 2013)	USA	N= 219 ; Distribution between groups not reported	100% female	28 years (SD=7.49)	48% Black 37% White 15% Other	Depression in women at risk of alcohol exposed pregnancy (AEP)	1x 60-minute face to face motivational enhancement therapy intervention	1) 3 videos about women and alcohol misuse, AEP and foetal alcohol syndrome. Approx 45 minutes to view all videos, plus 5 minute debrief with therapist. 2) Informational brochure about foetal alcohol syndrome and	Primary Outcome Measures: drinks per drinking day (from TLFB) and ineffective contraception use Significant reduction in drinks per day across time ($p<.001$) for all groups but this was not significantly different for BI from the comparison condition	Unclear

								contraceptive options		

Table 2: Characteristics of trials of alcohol BI among participants with comorbid severe mental illness

Study Reference	Country	Sample size	Gender	Mean Age (S.D.)	Ethnicity	Mental Health Condition	Brief Intervention	Comparator	Key Findings	Risk of Bias
Brief intervention vs. minimally active comparator										
Bagøien 2013 (Bagøien et al., 2013)	Norway	Intervention group n = 67; Control group n = 68	42% female	36.5 years (SD=13.7)	Not reported	Admittance to Psychiatric Emergency Department	2x sessions of manual guided motivational interviewing. Each session was around 15 minutes	TAU	Primary Outcome Measure: days of monthly substance use in the last 3 months Net difference at 24 months in substance use was 7.3 days per month between intervention and comparison group (95% CI 1.9 to 12.6, p < 0.01) Analysis of only alcohol use showed significant reduction in number of days per month of alcohol consumption compared to comparison group at 24-month follow-up (net difference of 4.7 days per month, 95% CI 0.4 to 9.0)	Unclear
Baker 2002 (Baker et al., 2002)	Australia	N= 79 motivational interview; N=81 control	25% female	30.9 years (SD not reported)	Not reported	Psychiatric in-patients	1 x 30-45-minute session motivational interviewing regarding alcohol/drug use. They were then given a pamphlet giving details of the	Participants Informed that they were using substances at a hazardous level and should cut down, plus a	Primary Outcome Measures: alcohol use disorders and non-alcohol psychoactive substance use disorders sections of the SCID to determine lifetime and current substance abuse or dependence, and the OTI to assess consumption of 11	Unclear

Study Reference	Country	Sample size	Gender	Mean Age (S.D.)	Ethnicity	Mental Health Condition	Brief Intervention	Comparator	Key Findings	Risk of Bias
							substance misuse service	pamphlet giving details of the substance misuse service	classes of drug during the month preceding interview. Overall both groups improved in terms of their alcohol consumption on the OTI (P<0.01) but there were no significant differences between the BI group compared with comparison group.	
Eberhard 2009 (Eberhard et al., 2009)	Sweden	N=177 brief intervention; N= 167 control	72% women	Women 37 years (SD=13) Men 39 years (SD=14)	Not reported	Non-psychotic psychiatric outpatients	Immediate personalised telephone feedback from AUDIT and advice given. 1x 15-minute session	No intervention at baseline, screening and immediate feedback at 6 months	Primary Outcome Measure: AUDIT score Significant reduction in hazardous drinking (measured by AUDIT) in intervention group compared with comparison group at 6 months (P<0.001)	Unclear
Hulse & Tait 2002 (Hulse and Tait, 2002)	Australia	N=62 Brief intervention, N=58 Information Package	46% female	31.7 years (SD=10.2)	Not reported	Psychiatric in-patients	45-minute session covering benefits and drawbacks of alcohol use and tailored written feedback	Information package containing information on safer alcohol consumption patterns and comparison scores for alcohol	Primary Outcome Measure: total weekly consumption of alcohol. Main effect of Group (motivational vs. information) was not significant but the interaction between Time and Group was significant (F = 8.2, df 1,70, p < 0.01) with the motivational group having a	Unclear

Study Reference	Country	Sample size	Gender	Mean Age (S.D.)	Ethnicity	Mental Health Condition	Brief Intervention	Comparator	Key Findings	Risk of Bias
								consumption surveys	higher alcohol consumption at baseline (mean 6.3 (SD 2.5) vs. 5.5 (SD 2.4) but a lower consumption than the information group at follow-up (mean 2.8 (SD 2.0) vs. 3.6 (SD 1.8).	
Nehlin 2012 (Nehlin et al., 2012)	Sweden	150	65% female	30.7 years, SD 11.7	Not reported	Psychiatric outpatients	15-20 minute BI comprising personalised brief advice	Minimal intervention including questionnaire package and alcohol information leaflet	Primary Outcome Measure: changes in AUDIT score at 12 months At 12 months, there was an overall reduction in AUDIT scores in the whole sample from 10.9 to 9.8 ($F = 10.2$, $p < 0.01$, $d=0.27$). The BI did not affect AUDIT scores more than the "minimal" intervention	Unclear
Brief intervention vs. active comparator										
Graeber 2003 (Graeber et al., 2003)	USA	N=15 MI, N=15 EI.	4% female	MI group: 42.87 (SD=5.62) EI group: 45 (SD=7.28)	40% Non-Hispanic White 40% Hispanic 20% African American	Psychosis	3 x 1 hour sessions of motivational interviewing (MI) focussing on personal choice and responsibility	3x 1hr sessions education intervention (EI) on alcohol use, the harms of alcohol and included CBT	Primary Outcome Measure: post-treatment drinking behaviour Significantly more participants were abstinent, and had fewer drinking days in the MI condition at 8-week $X^{2(1)}=11.87$, $p<.0006$ and 24-	High

Study Reference	Country	Sample size	Gender	Mean Age (S.D.)	Ethnicity	Mental Health Condition	Brief Intervention	Comparator	Key Findings	Risk of Bias
								techniques on cutting down alcohol use	week $x^{2(1)}$=11.34, p<.008 follow-up than in the comparison group	