

## ORIGINAL ARTICLE

## The Impact of Brief Alcohol Interventions in Primary Healthcare: A Systematic Review of Reviews

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**Abstract** — **Aims:** The aim of the study was to assess the cumulative evidence on the effectiveness of brief alcohol interventions in primary healthcare in order to highlight key knowledge gaps for further research. **Methods:** An overview of systematic reviews and meta-analyses of the effectiveness of brief alcohol intervention in primary healthcare published between 2002 and 2012. **Findings:** Twenty-four systematic reviews met the eligibility criteria (covering a total of 56 randomized controlled trials reported across 80 papers). Across the included studies, it was consistently reported that brief intervention was effective for addressing hazardous and harmful drinking in primary healthcare, particularly in middle-aged, male drinkers. Evidence gaps included: brief intervention effectiveness in key groups (women, older and younger drinkers, minority ethnic groups, dependent/co-morbid drinkers and those living in transitional and developing countries); and the optimum brief intervention length and frequency to maintain longer-term effectiveness. **Conclusion:** This overview highlights the large volume of primarily positive evidence supporting brief alcohol intervention effects as well as some unanswered questions with regards to the effectiveness of brief alcohol intervention across different cultural settings and in specific population groups, and in respect of the optimum content of brief interventions that might benefit from further research.

## INTRODUCTION

A range of interventions exist for the prevention and treatment of alcohol-related risk and harm, from health-promoting input aiming at reducing hazardous and harmful drinking, to more intensive and specialist treatment for severely dependent drinking. Primary healthcare is seen as an ideal context for the early detection and secondary prevention of alcohol-related problems, due to its high contact-exposure to the population (Lock *et al.*, 2009), and the frequency with which higher-risk drinkers present (Anderson, 1985).

In particular, screening and brief intervention for alcohol has emerged as a cost-effective preventative approach (Hutubessy *et al.*, 2003), which is relevant and practicable for delivery in primary healthcare (Raistrick *et al.*, 2006), where patients tend to present with less acute conditions, return regularly for follow-up appointments (Bernstein *et al.*, 2009) and build long-term relationships with their GP (Lock, 2004). These interventions are typically short in duration (5–25 min), designed to promote awareness of the negative effects of drinking and to motivate positive behaviour change (HoC Health Committee, 2010).

Despite considerable efforts over the years to persuade practitioners to adopt brief interventions in practice, most have yet to do so. Indeed, there is an international literature on barriers to brief alcohol intervention (Heather, 1996; Kaner *et al.*, 1999; Babor and Higgins-Biddle, 2000; Aalto *et al.*, 2003; Aira *et al.*, 2003; Wilson *et al.*, 2011), the majority focussing on primary healthcare. These barriers include: lack of time, training and resources; a belief that patients will not take advice to change drinking behaviour; and a fear amongst practitioners of offending patients by discussing alcohol. It has therefore been argued that today's challenge is more about how to encourage the uptake and use of brief alcohol intervention in routine practice (Anderson *et al.* 2004; Nilsen *et al.*, 2006; Johnson *et al.*, 2010; Kaner, 2010a; Gual and Sabadini

2011), and less about financing additional research on its effectiveness. It would seem timely, therefore, to evaluate the extent to which the primary healthcare brief alcohol intervention evidence base is now saturated, or whether there are any remaining knowledge gaps requiring further investigation.

This paper reports on the EU co-funded research BISTAIRS (brief interventions in the treatment of alcohol use disorders in relevant settings) project, which aims to intensify the implementation of brief alcohol intervention by identifying, systematizing and extending evidence-based good practice across Europe. Given the existence of several reviews in this field, and the overarching BISTAIRS timescale, the first phase of the project comprised a systematic overview of published reviews to provide a structured, comprehensive summary of the evidence base on the effectiveness of brief alcohol intervention in primary healthcare.

The focus on effectiveness (how an intervention performs in real world conditions) as opposed to efficacy (how an intervention performs under optimal or ideal world conditions) is deliberate. There is a well-established literature on the distinction between efficacy and effectiveness trials (Flay, 1986), although the terms explanatory or pragmatic trials are sometimes also used (Thorpe *et al.*, 2009). However, placing trials into one category or other is challenging since there is wide agreement that they actually sit on a continuum from optimized to naturalistic conditions (Gartlehner *et al.*, 2006). Moreover, efficacy must be demonstrated before effectiveness is assessed and the latter is a necessary pre-condition for wider dissemination (Flay *et al.*, 2005). The US Society for Prevention Research (Flay *et al.*, 2004, 2005) has outlined that efficacy testing requires at least two rigorous trials involving: tightly defined populations; psychometrically sound measures and data collection procedures; rigorous statistical analysis; consistent positive effects (without adverse effects); and at least one significant long-term follow-up. This requirement has been comprehensively established in a field where over 60

high-quality brief intervention trials have been reported in peer-reviewed journals, with over half based in primary healthcare (Kaner, 2010b).

This paper focuses on effectiveness, adding clinical breadth to methodological rigour by: extending the range of patients and delivery agents in trials; specifying details of necessary training and technical support; clarifying the nature of comparison or control conditions; assessing intervention fidelity; and conducting unbiased (generally intention to treat) analyses, which also considers effects on different sub-groups of patients and differing outcome exposures (Flay *et al.*, 2005; Thorpe *et al.*, 2009). To add to the brief alcohol intervention literature, we synthesize the findings from a rapidly growing number of systematic reviews to answer four questions: (a) does the cumulative evidence base continue to show that brief alcohol intervention is effective when delivered in primary healthcare settings? (b) is brief alcohol intervention equally effective across different countries and different healthcare systems? (c) is the brief alcohol intervention evidence base applicable across different population groups? and (d) what is the optimum length, frequency and content of brief alcohol intervention, and for how long is it effective?

## METHODS

Standard systematic reviewing methods were tailored to identify existing reviews rather than primary research (CRD, 2001). Reporting was carried out according to PRISMA statement guidelines (Moher *et al.*, 2009) (see Supplementary material, Appendix 1 for full details). The review team comprised international experts in the field of brief alcohol interventions (EK, PA) and in systematic reviewing methods (DNB).

One author (AO) searched MEDLINE, EMBASE, PsycInfo, The Cochrane Database, The Database of Abstracts of Reviews of Reviews and the Alcohol and Alcohol Problems Science Database between July and August 2012 using appropriate MeSH terms. The search was split into three core concepts: (a) setting: general practice, general practitioners, physician, family practice, primary health care, community health services and family physician; (b) intervention: alcohol, brief intervention, early intervention, alcohol therapy, counselling and intervention; and (c) study design: systematic review, review and meta-analysis (full details of database-specific search terms are available upon request from the corresponding author). Reference lists of selected reviews and relevant websites, including the National Institute for Health and Care Excellence and the World Health Organisation, were also searched and appropriate experts contacted in order to identify unpublished reviews. The title and abstract of all records were screened by a single reviewer (AO), with full text copies of potentially relevant papers retrieved for in-depth review against the inclusion criteria. Any queries were resolved through discussion with the wider review team (AO, DNB, EK, PA).

Full systematic reviews and meta-analyses of studies examining the effectiveness of brief alcohol intervention in comparison to control conditions in primary healthcare settings and published between 2002 and 2012 were eligible for inclusion. Primary healthcare was operationalized to include all immediately accessible general healthcare facilities but not emergency settings. Brief intervention was defined as a single session and/or up to a maximum of five sessions of

engagement with a patient, and the provision of information and advice designed to achieve a reduction in risky alcohol consumption or alcohol-related problems. Primary outcomes of interest included changes in self- or other reports of drinking quantity and/or frequency, drinking intensity and drinking within recommended limits.

The methodological quality of eligible studies was assessed independently by two reviewers (AO and DNB) using the Revised Amstar tool (R-AMSTAR) (Kung *et al.*, 2010). Data were extracted on: healthcare setting; characteristics of the target population; authors' conclusions; and any identified evidence gaps. Data were extracted against a data abstraction template by one author (AO) and checked by another (DNB) with reference to the full article text. Extracted data also included inclusion/exclusion criteria, reported analyses and analysis type. No statistical analyses or meta-analyses were conducted. Instead, the existing analyses reported in the articles reviewed were extracted systematically, with the findings reported in a structured narrative synthesis.

## RESULTS

Twenty-four individual systematic reviews met the eligibility criteria (see Figure 1) (Chang, 2002; Moyer *et al.*, 2002; Beich *et al.*, 2003; Berglund *et al.*, 2003; Huibers *et al.*, 2003; Ballesteros *et al.*, 2004a,b; Cuijpers *et al.*, 2004; Whitlock *et al.*, 2004; Bertholet *et al.*, 2005; Littlejohn, 2006; Gordon *et al.*, 2007; Kaner *et al.*, 2007; Parkes *et al.*, 2008; Solberg *et al.*, 2008; Peltzer, 2009; Jackson *et al.*, 2010; Latimer *et al.*, 2010; Saitz, 2010; Bray *et al.*, 2011; Gilinsky *et al.*, 2011; Sullivan *et al.*, 2011; Jonas *et al.*, 2012; Babor *et al.*, 2013). Establishing the precise number of unique trials covered by this evidence base is challenging due to the slightly different emphases of some reviews. Nevertheless, we identified 56 primary healthcare trials reported across 80 separate publications.

The mean R-AMSTAR score for the 24 included reviews was 29 (median 30.5; range 13–44). These numeric scores translated into grades as follows: 13–20 = D; 21–28 = C; 29–36 = B; and 37–44 = A. Using R-AMSTAR scoring, five reviews were categorized as an 'A' grade publication (Huibers *et al.*, 2003; Bertholet *et al.*, 2005; Kaner *et al.*, 2007; Sullivan *et al.*, 2011; Jonas *et al.*, 2012), eight were categorized as 'B' (Beich *et al.*, 2003; Ballesteros *et al.*, 2004a,b; Jackson *et al.*, 2010; Latimer *et al.*, 2010; Bray *et al.*, 2011; Gilinsky *et al.*, 2011; Babor *et al.*, 2013), seven as 'C' (Cuijpers *et al.*, 2004; Whitlock *et al.*, 2004; Littlejohn, 2006; Gordon *et al.*, 2007; Parkes *et al.*, 2008; Solberg *et al.*, 2008; Saitz, 2010) and four as 'D' (Chang, 2002; Moyer *et al.*, 2002; Berglund *et al.*, 2003; Peltzer, 2009). Table 1 and the following sections report the key findings against each focus review question, with additional characteristics of the included reviews available in Supplementary material, Appendix 2.

### *Question 1: is brief alcohol intervention effective when delivered in primary healthcare settings?*

Across the eligible reviews, it is consistently reported that brief alcohol interventions are effective at reducing hazardous and harmful drinking in primary healthcare (Moyer *et al.*, 2002; Beich *et al.*, 2003; Berglund *et al.*, 2003; Ballesteros *et al.*, 2004a,b; Cuijpers *et al.*, 2004; Whitlock *et al.*, 2004;

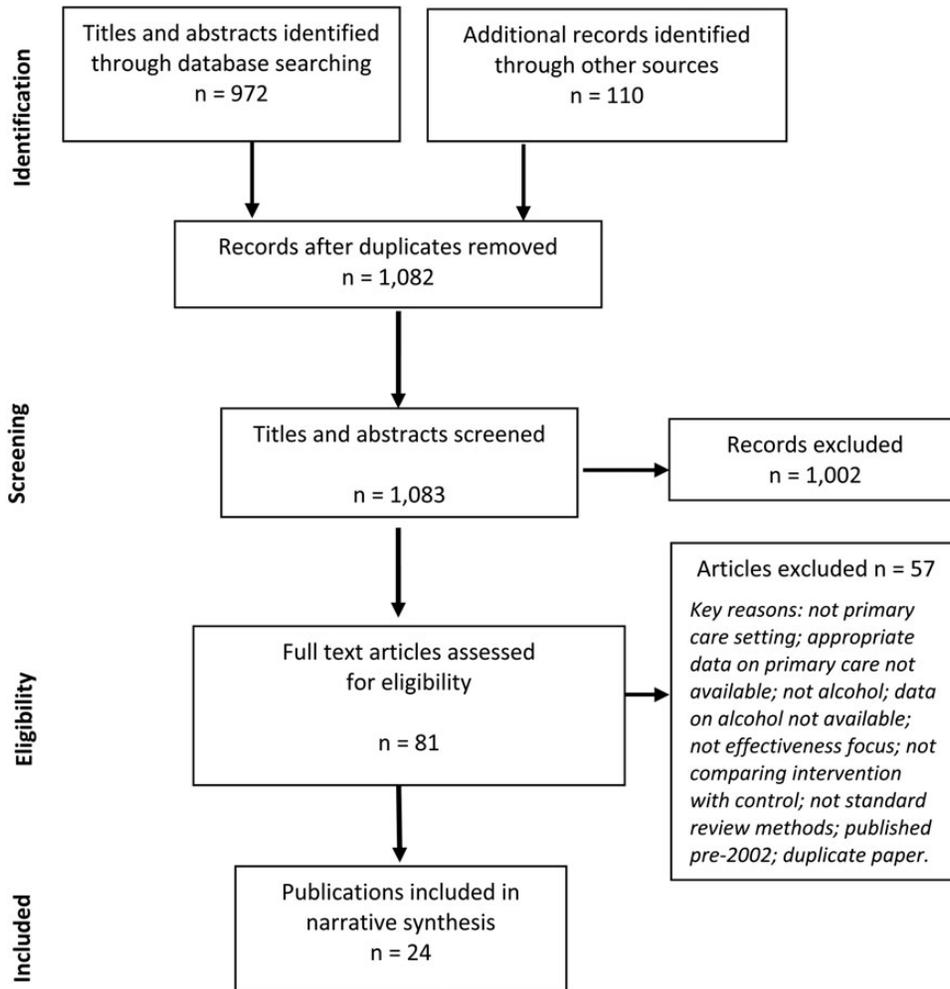


Fig. 1. Flow chart showing the number of potentially relevant references identified by searches and number meeting inclusion criteria and included in the narrative review of systematic reviews.

Bertholet *et al.*, 2005; Littlejohn, 2006; Gordon *et al.*, 2007; Kaner *et al.*, 2007; Solberg *et al.*, 2008; Peltzer, 2009; Jackson *et al.*, 2010; Latimer *et al.*, 2010; Saitz, 2010; Bray *et al.*, 2011; Gilinsky *et al.*, 2011; Jonas *et al.*, 2012). Whilst the overall evidence base suggests that brief alcohol interventions are effective in such settings, some individual trials have reported a null finding. Indeed a large UK trial (SIPS), not included in the reviews due to recency, has reported improvements in hazardous and harmful drinking in patients receiving simple feedback and a patient information leaflet (the control condition) as well as in those receiving 5 min of structured advice, and those receiving a further 20 min brief lifestyle counselling (Kaner *et al.* 2013). This null finding (no significant difference between the three conditions) accords with three systematic reviews focussing on control conditions only, which found consistently reduced drinking in these groups over time (Jenkins *et al.* 2009; Bernstein *et al.* 2010; McCambridge and Kypri 2011). Thus the mere fact of enrolment in a brief intervention trial may be associated with positive behaviour change due to a general 'Hawthorn Effect', whereby increased attention or scrutiny influences drinking, or volunteering in itself means that the individual has started a change process. Screening or assessment reactivity (a simple response to screening procedures or measurement of drinking

behaviour) could also explain these reduced drinking trends. Lastly, regression to the mean is a real possibility in this field, since heavy drinking can spontaneously fall over time. Nevertheless, the cumulative (pooled) analyses reported in successive systematic reviews reveal positive brief intervention effects *over and above* those seen in control conditions who typically received assessment only, treatment as usual or written advice.

Weekly alcohol consumption was the most commonly reported outcome, and meta-analysis by Kaner *et al.* (2007) showed that compared with control conditions, brief intervention reduced the quantity of alcohol drunk by 38 g per week (95% CI (confidence interval): 23–54 g). This is slightly less than the overall effect size found by Jonas *et al.* (2012), which suggested that brief intervention compared with controls in primary healthcare reduced alcohol consumption by 49 g per week for adults aged 18–64 (95% CI: 33–66 g). However, the latter review also found average weekly reductions of 23 g (95% CI 8–38 g) for older adults aged 65 and over, and 23 g (95% CI 10–36 g) for young adults/college students aged 18–30 following brief alcohol intervention.

Delivery by a range of practitioners in primary healthcare settings has beneficial effects (Huibers *et al.*, 2003), although findings of one review suggest that the effect sizes are greater

Table 1. Summary of authors' conclusions and identified evidence gaps

Study	Q1: Is alcohol BI for alcohol effective when delivered in primary health care settings?	Q2: Is alcohol BI equally effective across different countries/health care systems?	Q3: Is the alcohol BI evidence base applicable to all population groups?	Q4: What is the optimum length/frequency/content of alcohol BI and how long is it effective?
Babor <i>et al.</i> (2013) (in press)	Consistently reported that BI was clinically and cost-effective for non-treatment seeking populations.	Majority of evidence has limited or no LAMIC (low and middle income countries) applicability. Whilst there is some evidence to suggest that alcohol BI equality effective in HIC (high income countries) and LAMIC, however context-specific health issues may not be adequately addressed solely by HIC research findings. Therefore more culturally-specific research needed in LAMIC.	Brief intervention in primary health care appears to be most impactful in non-treatment seeking populations. Inconclusive findings on alcohol BI in antenatal settings.	Question not addressed in this review
Ballesteros <i>et al.</i> (2004a)	Results suggest BI equally effective in both men and women.	Question not addressed in this review	Results support the equality of BI outcomes for reducing hazardous alcohol consumption in both men and women.	Question not addressed in this review
Ballesteros <i>et al.</i> (2004b)	Although indicating smaller effect sizes than previous meta-analyses, results support the moderate efficacy of BIs.	Question not addressed in this review	BI appears to have greater efficacy when applied in general screening programs to non-treatment seeking populations.	Suggested more research needed to establish whether extended BI more efficacious than BI. Also, identified need for further naturalistic studies on long-term BI efficacy.
Beich <i>et al.</i> (2003)	Results suggests alcohol BI effective, though at lower levels than reported previously (pooled absolute risk reduction from BI was 10.5% (95% CI 7.1–13.9%) A random effects model yielded a similar result: 10% (6–14%). The pooled number needed to treat (NNT) was 10 (7 to 14)).	Question not addressed in this review	Question not addressed in this review	Question not addressed in this review
Berglund <i>et al.</i> (2003)	Majority (18 of 25 RCTs) showed BI had a significant positive effect in health care settings (primary care and hospital settings). Some evidence for positive impact on number of hospital days/incidence of new injuries and need for hospital care.	Question not addressed in this review	(Limited) evidence suggests alcohol BI equally effective in men and women. However notes that most studies conducted with populations consisting of middle-aged male heavy drinkers. Lack of evidence on treatment of homeless patients and for patients with psychiatric co-morbidity. Although some studies included dependent patients, review excluded any studies focused on this group of patients only.	However, uncertainty/limited evidence on longer-term effect sizes of alcohol BI (past 2 years). Review excluded studies that compared BI with extended BI but highlighted lack of evidence on design of optimal BI.
Bertholet <i>et al.</i> (2005)	Alcohol BI effective in reducing alcohol consumption at 6 and 12 months (adjusted intention-to-treat analysis showed a mean pooled difference of –38 g/week in favour of the BI group). Limited evidence on impact on reduction of health care utilization.	Question not addressed in this review	BI was concluded to be beneficial in men and women in a primary care context.	Lack of evidence of alcohol BI on morbidity, mortality and quality of life measures. More research needed to identify which components of BI present evidence of efficacy in primary health care.

Bray <i>et al.</i> (2011)	Alcohol BI has a small, negative effect on emergency department utilization. However no significant effect was found for outpatient or in patient health care utilization.	Question not addressed in this review	Question not addressed in this review	Question not addressed in this review
Chang (2002)	Findings suggest that alcohol BI do not appear to be consistently helpful to women drinkers.	Question not addressed in this review	Mixed/inconsistent evidence for alcohol BI effectiveness in both genders. However, pregnant women were found to reduce their drinking in two of the studies reviewed; thus pregnancy may provide a powerful incentive to reduce alcohol drinking.	Question not addressed in this review
Cuijpers <i>et al.</i> (2004)	Findings suggest positive impact of alcohol BI on reducing mortality (although limited detailed/verified data available from alcohol BI trials on mortality rates between pre-test and follow-up). Pooled relative risk (RR) of dying in BI compared to control conditions was 0.47 for the four studies (95% CI: 0.25, 0.89). The pooled RR of all 32 studies was comparable (RR = 0.57; 95% CI: 0.38, 0.84).	Meta-analysis of mortality only included USA, UK and Australian data.	Acknowledged fact that study populations differed considerably, although sensitivity analyses suggested comparable outcomes.	Acknowledges variation in content of included interventions but emphasizes that multiple sensitivity analyses excluding particular studies/sets of studies, all resulted in comparable BI outcomes.
Gilinsky <i>et al.</i> (2011)	There was some evidence from a small number of studies that single session face to face brief interventions resulted in positive effects on the maintenance of alcohol abstinence during pregnancy. Women choosing abstinence as their drinking goals and heavier drinking women who participated with a partner were more likely to be abstinent at follow up. However more intensive interventions may be required to encourage women who continue to drink during pregnancy to reduce their consumption.	Question not addressed in this review	Identified lack of high quality evidence for effectiveness of alcohol BI in pregnant women. Overall, there was insufficient evidence to determine whether such interventions delivered during the antenatal period are effective at helping women to reduce alcohol consumption during pregnancy.	Question not addressed in this review
Gordon <i>et al.</i> (2007)	Although alcohol and dietary interventions appeared to be economically favourable (cost-effective), it is difficult to draw conclusions because of the variety in study outcomes. Generally, the costs of the behavioural interventions reviewed were low relative to those for other healthcare interventions such as pharmaceutical management. The behavioural interventions aimed at populations with high-risk factors for disease were more cost-effective than those aimed at healthy individuals.	Question not addressed in this review	Noted tendency to omit cultural minorities in studies across multiple behavioural intention cost effectiveness studies. General lack of evidence (across multiple behavioural intention areas) of cost effectiveness for disadvantaged populations.	Question not addressed in this review

Continued

Table 1. *Continued*

Study	Q1: Is alcohol BI for alcohol effective when delivered in primary health care settings?	Q2: Is alcohol BI equally effective across different countries/health care systems?	Q3: Is the alcohol BI evidence base applicable to all population groups?	Q4: What is the optimum length/frequency/content of alcohol BI and how long is it effective?
Huibers <i>et al.</i> (2003)	Not possible to draw an overall conclusion concerning the effectiveness of 'psychosocial interventions by general practitioners' since studies were not comparable in numerous aspects (intervention, outcome, population). In relation to alcohol, review found that GP-delivered BI seem no more effective than other, more simple interventions or when delivered by a nurse practitioner.	Question not addressed in this review	Question not addressed in this review	Question not addressed in this review
Jackson <i>et al.</i> (2010)	Evidence found for the positive impact of alcohol BI on alcohol consumption, mortality, morbidity, alcohol-related injuries, alcohol-related social consequences, and healthcare resource use. Further, alcohol BI were shown to be effective in both men and women.	Question not addressed in this review	Study populations made up primarily of adults therefore limited evidence identified for the effectiveness of brief interventions in young people. Participants were mainly Caucasian in origin and ethnicity of study populations was poorly reported in general. Although socioeconomic status was not shown to influence the effectiveness of BI, there was limited evidence in this area. Limited evidence (only one review) of BI effectiveness in patients with dual diagnosis of psychiatric condition and alcohol misuse Relationship between the level of alcohol dependence and the effectiveness of brief interventions was unclear.	Limited evidence suggests that even very brief interventions may be effective in reducing negative alcohol-related outcomes. The benefit arising from increased exposure or the incorporation of motivational interviewing principles was unclear. Due to the extensive heterogeneity/lack of reported detail in the characteristics of the brief interventions evaluated, it is difficult to define the effective components of brief interventions.
Jonas (2012)	Overall, evidence supports the effectiveness of behavioural interventions for improving several intermediate outcomes for adults, older adults, and young adults/college students (average reduction of 3.6 drinks per week for adults compared with control, 11% increase in the % of adults achieving recommended drinking limits over 12 months).	Question not addressed in this review	Limited data on effectiveness for <i>pregnant</i> women in terms of consumption; insufficient evidence with regards to reduction in heavy drinking episodes or with pregnant women, particular at 6 months+. Insufficient evidence on effectiveness in reducing heavy drinking episodes for older adults; on drinking within recommended limits for college age students; or on mean consumption, heavy drinking episodes or drinking within recommended limits for adolescents. Ethnicity data generally not reported for participants and low rates of non-White participants except for two included trials (one conducted in Thailand, 100% Thai) and one in urban academic practice (80–82% non-white). Not clear whether findings applicable to people with comorbid medical or psychiatric conditions.	Brief multi-contact interventions have the best evidence of effectiveness across populations, outcomes, and have follow-up data over several years. However, differences between control and intervention groups not statistically significant past 48 months; and in general, insufficient evidence on effectiveness 6 months +. Insufficient evidence to draw firm conclusions on required intensity of intervention, including which specific components needed to be included.

Kaner <i>et al.</i> (2007)	Overall, brief interventions significantly lowered alcohol consumption at one year (mean difference: -38 grams/week, 95% CI: -54 to -23). Absence of a difference in outcomes between efficacy and effectiveness trials suggested that this literature was relevant to routine primary care.	Question not addressed in this review	Insufficient data on ethnic differences. Results suggest no significant positive effect of alcohol BI in women however there was a general lack of available evidence disaggregated by gender.	Evidence suggests that longer duration of counseling has little additional effect.
Latimer <i>et al.</i> (2010)	Screening plus brief intervention is cost effective in the primary care setting.	Question not addressed in this review	Lack of evidence of long-term impacts of alcohol BI for young people.	Lack of evidence on long-term impacts of alcohol BI, particularly in relation to impact of re-application versus maintenance of original intervention impact. Uncertainty with regards to longer term health care resource use, crime and motor vehicle accident effects; and limited evidence on impact of alcohol BI on HRQL. Very brief interventions are likely to be more cost effective than extended brief interventions but highlighted heterogeneity of evidence base on length of BI.
Littlejohn (2006)	Post recruitment, patients' SES does not appear to influence intervention outcome, with alcohol BI equally effective in patients of different socio-economic status.	Question not addressed in this review	Equivocal evidence with regards to link between SES and intervention participation. Suggested more research needed to better understand the characteristics of those who decline to participate in BI research.	Question not addressed in this review
Moyer <i>et al.</i> (2002)	34 trials focused on prevention found small to medium aggregate effect sizes in favour of brief interventions in non-treatment seeking populations across different follow-up points.		Lack of evidence on effectiveness of alcohol BI in dependent patients. No significant difference in effect observed between men and women, but highlights lack of gender-focused studies in this field.	Limited evidence on longer-term effects of alcohol BI (12 months +) and in general, results suggest a decay over time in impact. Overall, no significant difference in effects between brief versus extended interventions.
Parkes <i>et al.</i> (2008)	Some (limited) evidence to suggest alcohol BI can be effective in pregnant women and in women of child-bearing age.	Question not addressed in this review	Mixed evidence of efficacy of BI for pregnant women. In particular, lack of evidence of effect on different ethnic groups for pregnant women and on different income levels.	No evidence on long-term impact as follow up limited to 9 months at most in the included studies.
Peltzer (2009)	Brief alcohol interventions in sub-Saharan health settings showed positive results.	Although positive impacts identified, review highlights small number of trials and challenges experienced to embed in practice in sub-Saharan settings.	Question not addressed in this review	Question not addressed in this review
Saitz (2010)	Alcohol screening and BI has efficacy in primary care for patients with unhealthy but not dependent alcohol use.	Question not addressed in this review	Lack of evidence to support efficacy of alcohol BI in very heavy or dependent drinkers. Further, small sample sizes and other study design factors limit generalizability of findings.	Question not addressed in this review

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Table 1. *Continued*

Study	Q1: Is alcohol BI for alcohol effective when delivered in primary health care settings?	Q2: Is alcohol BI equally effective across different countries/health care systems?	Q3: Is the alcohol BI evidence base applicable to all population groups?	Q4: What is the optimum length/frequency/content of alcohol BI and how long is it effective?
Solberg <i>et al.</i> (2008)	Brief screening and counselling for alcohol misuse in primary care is both more effective/cost-effective than most other effective preventative services. Sparse data on efficacy in preventing alcohol-attributable morbidity and mortality.	Question not addressed in this review	Highlights fact that dependent drinkers excluded or lack of disaggregated data on efficacy/adherence for dependent as opposed to non-dependent drinkers.	Limited evidence of long-term effectiveness (12 months +) and no studies at 5 years +
Sullivan <i>et al.</i> (2011)	Review offers preliminary support for the benefit of brief interventions for unhealthy alcohol use by non-physicians, either alone or in combination with physicians. There is evidence that non-physician-based interventions are as effective as physician-based interventions and when added to physician-based interventions can significantly improve drinking outcomes. However, summary effect size observed for non-physician interventions of 1.7 fewer standard drinks per week is smaller than that observed for other clinician-based interventions in primary care settings (2.7 fewer standard drinks per week but within the 95% CI [1.6–3.9 standard drinks] of that result).	Question not addressed in this review	Question not addressed in this review	Question not addressed in this review
Whitlock <i>et al.</i> (2004)	Alcohol BI in primary health care settings reduced risky and harmful alcohol use for several alcohol outcomes (at 6–12 months, brief counseling interventions (with up to 15 min contact and at least 1 follow-up) reduced the average number of drinks per week by 13–34% more than controls. The proportion of participants drinking at ‘safe’ levels was 10–19% greater than controls).	Question not addressed in this review	No consistent differences found between men and women. Some evidence to suggest alcohol BI effective in older populations in comparison with younger adults. Low or non-reported non-white participation	Results suggested brief, multi-contact interventions more effective than very brief or brief single-contact interventions. Lack of evidence to determine relationship between intervention effects and specific BI components. Although all interventions that showed significant improvements in outcomes included at least 2 out of 3 key elements (feedback, advice and goal setting). Mixed/limited data on long-term mortality and morbidity benefits, especially for groups other than males, with less severe drinkers and with low-intensity interventions. One study reported maintenance of improved drinking at 4 years follow-up.

if delivered by doctors (Sullivan *et al.*, 2011). Finally, whilst available evidence remains limited, results from one meta-analysis found indications of the effectiveness of brief alcohol intervention on mortality outcomes, estimating a reduction in problem drinkers of about 23–36% (Cuijpers *et al.*, 2004).

*Question 2: is brief alcohol intervention equally effective across different countries and different health care systems?*

There is a geographic bias, with the majority of previous research conducted in high-income regions, and in particular, English and Nordic speaking countries. Out of the 24 eligible reviews, fewer than half included data from studies based outside Europe and/or the developed world (ten reviews: Moyer *et al.*, 2002; Berglund *et al.*, 2003; Cuijpers *et al.*, 2004; Whitlock *et al.*, 2004; Bertholet *et al.*, 2005; Peltzer, 2009; Latimer *et al.*, 2010; Saitz, 2010; Jonas *et al.*, 2012; Babor *et al.* 2013). As the review of reviews by Babor *et al.* (2013) emphasizes, research findings from developed countries may not be generalizable to developing and transitional countries on a number of grounds. In addition to structural and political differences, there are known differences in drinking patterns and abstinence rates between lower and higher income countries, and health consequences vary. Although the behavioural theory that underpins the design and delivery of brief intervention is *likely* to be ‘universally’ effective (Anderson *et al.*, 2009), and certainly Jonas *et al.* (2012) found similar effectiveness for brief alcohol intervention both within and outside the USA, a need remains for further culturally-specific research in countries outside the USA and Western Europe in order to demonstrate this conclusively (Peltzer, 2009).

It is also worth mentioning that half the included reviews (12 reviews: Beich *et al.*, 2003; Whitlock *et al.*, 2004; Littlejohn, 2006; Gordon *et al.*, 2007; Parkes *et al.*, 2008; Peltzer, 2009; Latimer *et al.*, 2010; Saitz, 2010; Bray *et al.*, 2011; Gilinsky *et al.*, 2011; Sullivan *et al.*, 2011; Jonas *et al.*, 2012) were based exclusively on studies published in the English language. Given the resulting potential for publication bias (authors are more likely to publish significant results in English-language journals (Egger *et al.*, 1997)), this suggests a need for increased linguistic (alongside geographic) diversity in future systematic reviews in this field (Babor *et al.*, 2013).

*Question 3: is the brief alcohol intervention evidence base applicable across different population groups?*

Although overall the evidence implies that brief alcohol intervention is equally effective in men and women (Ballesteros *et al.*, 2004a; Whitlock *et al.*, 2004; Bertholet *et al.*, 2005), most studies to date have either focussed on male drinkers or not reported the data disaggregated by sex (Moyer *et al.*, 2002; Berglund *et al.*, 2003; Kaner *et al.*, 2007). One review suggested that brief alcohol intervention may not be consistently helpful to women, or at least the results are more equivocal (Chang, 2002); and there is an identified lack of high-quality evidence on its effectiveness in pregnant women drinkers (Parkes *et al.*, 2008; Gilinsky *et al.*, 2011; Jonas *et al.*, 2012; Babor *et al.*, 2013). Whilst one review indicated that pregnancy itself may provide a powerful incentive to reduce alcohol drinking (Chang, 2002), another found insufficient evidence to determine the effectiveness of brief intervention delivered during the antenatal period, suggesting that more

intensive interventions may be required to encourage women who continue to drink during pregnancy to successfully reduce their consumption (Gilinsky *et al.* 2011).

Further, whilst brief intervention appears to improve alcohol-related outcomes for adults aged eighteen and over, evidence on effectiveness at either end of the age spectrum is less conclusive. Previous research (predominantly conducted in US college settings) suggests that effects appear less long-lived for young adults and college-age students, and there is insufficient evidence of brief alcohol intervention effectiveness in both adolescents (Kaner *et al.* 2007; Jackson *et al.* 2010; Latimer *et al.* 2010) and older adults (Kaner *et al.* 2007; Jonas *et al.* 2012), with only one review showing effect in adults aged 65 and over (Whitlock *et al.* 2004)).

There was limited consideration of the impact of socio-economic status on the effectiveness of brief alcohol intervention in the majority of the included reviews, with a general acknowledgment of the lack of evidence for disadvantaged populations in those that did (Littlejohn, 2006; Gordon *et al.*, 2007; Jackson *et al.*, 2010). Further, a number of reviews noted the tendency for studies either to omit ethnic minorities (Gordon *et al.*, 2007) or to be poorly reported where non-White participants were included (Whitlock *et al.*, 2004; Kaner *et al.*, 2007; Jackson *et al.*, 2010; Jonas *et al.*, 2012).

Finally, a number of reviews suggest that brief alcohol intervention was most impactful in non-treatment seeking, non-dependent patient populations (Moyer *et al.*, 2002; Ballesteros *et al.*, 2004b; Babor *et al.*, 2013). However, other reviews highlight the equivocal nature of the existing evidence base (Jackson *et al.*, 2010), and/or emphasize the exclusion or lack of disaggregated data in primary studies for dependent versus non-dependent patients (Berglund *et al.*, 2003; Solberg *et al.*, 2008). There was also a lack of conclusive evidence on the use of brief alcohol intervention in patients with co-morbid medical or psychiatric conditions (Berglund *et al.*, 2003; Jackson *et al.*, 2010; Jonas *et al.*, 2012).

*Question 4: what is the optimum length, frequency and content of brief alcohol intervention, and for how long is it effective?*

Evidence also points towards a need for greater understanding of the temporal limits of brief alcohol intervention impact. Research shows that effect sizes are largest at the earliest follow-up points, with decay in intervention effects over time. This overview found limited information on the longer-term effectiveness of brief alcohol intervention past 48 months post-intervention (Moyer *et al.*, 2002; Latimer *et al.*, 2010; Jonas *et al.*, 2012). In addition, although recent evidence suggests that greater effect sizes may be achieved with brief multi-contact interventions (each contact up to 15 min), compared with very brief (up to 5 min) and brief (>5 min, up to 15 min) single-contact interventions (Jonas *et al.*, 2012), it is important to note that the 2007 Cochrane Review found that longer (more intensive) brief interventions offered no significant additional benefit over shorter input (Kaner *et al.*, 2007).

Few reviews considered the impact of the actual content of interventions on their effectiveness (Berglund *et al.*, 2003; Cuijpers *et al.*, 2004; Whitlock *et al.*, 2004; Jonas *et al.*, 2012). In general, these reviews highlighted a lack of available evidence on this issue, mainly due to the heterogeneity of the included studies. Whitlock *et al.* (2004) reported that all

interventions demonstrating statistically significant improvements in alcohol outcomes included at least two of the following three elements—feedback, advice and goal-setting—but added that, given that the most effective interventions were multi-contact, inevitably these also comprised additional assistance and follow-up. Further, as [Beich \*et al.\* \(2003\)](#) highlights, conversations about alcohol can take place in different ways in primary healthcare settings, thus the effectiveness of brief intervention may be as much down to the well-established ‘helping relationship’ between patient and practitioner as the frequency or content of contact *per se*.

## DISCUSSION

This review of systematic reviews supports the effectiveness of brief intervention at reducing alcohol-related problems across 56 trials and a wide range of patients in primary healthcare. However, it highlights knowledge gaps regarding the effectiveness of brief alcohol intervention with pregnant women, with older and younger drinkers, with those from ethnic minority groups, and in transitional and low income countries. There is also a need to determine the optimum length, frequency and necessary content of brief intervention required to maintain longer-term effects.

Further, although the general consensus is that brief alcohol interventions are ill-suited to the needs of dependent drinkers, who require more specialist and intensive support ([Saitz, 2010](#)), it is inevitable that routinely screening patients for excessive alcohol use in primary healthcare—an essential precursor to intervention—will identify those at the dependence end of the spectrum. Whilst primary healthcare practitioners clearly have an important role to play in terms of ‘signposting’ alcohol-dependent patients to more specialist treatment, they are also presented with a prime opportunity to deliver an intervention themselves at that point. Along with pharmacotherapy, modelling work by [Rehm and Roerecke \(2013\)](#) suggests that brief intervention in hospital settings is most effective at reducing mortality in alcohol-dependent patients. However, at present, comparable modelling data for this group of drinkers in primary healthcare settings are not available due to lack of alcohol consumption or diagnosis information ([Purshouse \*et al.\*, 2013](#)). With fewer than 10% of people affected by alcohol dependence currently receiving treatment ([Alonso \*et al.\*, 2004](#)), there may be considerable value in furthering our understanding of the extent to which brief interventions delivered in primary healthcare work in dependent drinkers. Given the dose–response relationship of alcohol consumption and related harms, greater health gains can be achieved with a 10% reduction from a dependent drinker than from a 10% reduction from a hazardous or harmful drinker ([Rehm and Roerecke, 2013](#)).

Yet even in populations and settings where brief alcohol intervention is known to be effective, there remain unanswered questions about which ‘active ingredients’ make for successful interventions ([Kaner, 2010a](#)). Research in primary healthcare settings shows that most control groups report a decrease in alcohol consumption, suggesting the possibility of either regression to the mean (in which extreme measures of behaviour tend to shift to less extreme positions over time), or that screening or assessment reactivity affects outcomes (i.e. assessments of alcohol use themselves contain a therapeutic element) ([Bertholet \*et al.\*, 2005](#); [Jonas \*et al.\*, 2012](#)). Findings

from three recent reviews appear to support this latter explanation ([Jenkins \*et al.\*, 2009](#); [Bernstein \*et al.\*, 2010](#); [McCambridge and Kypri, 2011](#)) and most recently, the results of the SIPS alcohol screening and brief intervention research programme also suggest that their trial control condition, consisting of simple feedback and written information about alcohol, may have contained active factors of behaviour change ([Kaner \*et al.\*, 2013](#)).

Further, as [Mitchie \*et al.\* \(2012\)](#) acknowledge, the issue of treatment fidelity presents an additional obstacle to our understanding of brief alcohol intervention effectiveness. For a variety of reasons, busy physicians dealing with alcohol in routine practice settings may deviate from guidelines and protocols of care ([Moriarty \*et al.\*, 2012](#)), as happens in other areas of clinical practice ([Dew \*et al.\*, 2010](#)). Thus, even when practitioners can be persuaded to engage in brief alcohol intervention, it is not possible to establish conclusively the causal chain between interventions as designed, and their subsequent outcomes (an issue that further complicates questions around which intervention components have most impact on alcohol-related outcomes ([McCambridge, 2013](#))).

These evidence gaps are not merely an academic concern. Given that the demand for healthcare is always likely to outstrip supply, determining the essential intervention elements is vital in order to inform the design, commissioning and delivery of more cost-effective measures to address alcohol-related harm ([McCambridge, 2013](#)). Thus there is a need for further research in the aforementioned areas where genuine knowledge gaps exist. Moreover, available research indicates that significant public health gains could be achieved if even the basic elements of brief alcohol intervention were mainstreamed in primary healthcare. Whilst acknowledging the inadequacy of the existing implementation evidence base, previous studies highlight the positive role of alcohol-specific, multi-component, and ideally, practitioner-tailored training programmes in routinising brief alcohol intervention delivery ([Anderson \*et al.\*, 2004](#); [Nilsen \*et al.\*, 2006](#)). However, workload demands remain a fundamental barrier to mainstream adoption, irrespective of individual knowledge levels and attitudes ([Johnson \*et al.\*, 2010](#)). On this basis, current research would suggest that time-pressed clinicians should focus on the following three ‘easy’ wins.

### *Short and simple is still effective*

First, busy practitioners need to be reassured that there is little evidence to suggest that longer or more intensive input provides additional benefit over shorter, simpler input ([Moyer \*et al.\*, 2002](#); [Kaner \*et al.\*, 2007](#)). Although one review found greater effect sizes associated with brief multi-contact interventions compared with other intensities ([Jonas \*et al.\*, 2012](#)), overall, there appears no significant advantage of extended brief intervention in reducing alcohol consumption ([Kaner \*et al.\*, 2007, 2013](#)). Even a single, 5-min session of structured brief advice on alcohol using a recognized, evidence-based resource based on FRAMES principles (Feedback, Responsibility, Advice, Menu, Empathy and Self-efficacy) is still likely to be effective.

### *Use the most active ingredients*

Second, given the weak relationship between duration of counselling and outcome, it may be the case that the structure and

content of brief interventions has more influence on patients' drinking than the total length of delivery (Kaner *et al.*, 2009). Whilst there remains an identified knowledge gap around the most 'active ingredients' of brief alcohol intervention, one must acknowledge some important developments in this field in recent years, not as yet reflected in published systematic reviews. Mitchie *et al.* (2012) sought to identify which specific behaviour change techniques (BCTs) led to improved outcomes for brief alcohol interventions (42 BCTs reviewed in total, although not all associated with brief alcohol intervention). They concluded that prompting self-recording of alcohol intake was associated with greater effect sizes from brief intervention, and called for further research to extend and develop this approach. A systematic review by McCambridge and Kypri (2011) also found that answering questions on drinking, including consumption, in brief alcohol intervention trials appeared to alter subsequent self-reported behaviour in non-intervention control groups. On this basis, asking the simple question 'how much do you drink?' may be enough to trigger a positive behaviour change.

#### Target the 'right' patients

Finally, whilst there is a recognized need for further evidence on the effectiveness of brief alcohol intervention in certain groups of patients (pregnant women, younger and older drinkers), given the large number of trials showing consistently positive outcomes in middle-aged men, at the very least, practitioners should target their efforts in this direction. Indeed, as two-thirds of all alcohol-attributable deaths in the 20- to 64-year-old EU population occur in those aged 45–64, Rehm *et al.* (2011) have argued tackling harmful use in this age group would be most effective in helping to rapidly reduce alcohol's health burden to society overall.

There are several limitations associated with this review of reviews, including some inherent weaknesses with this methodological approach in general. First, although there is a range of published reviews on brief alcohol intervention effectiveness, some questions of interest were only partially addressed by the available evidence base. For example, there were limited data available on the effectiveness of brief alcohol intervention in different models of primary healthcare systems, beyond the broad comparison on geographic grounds. Second, in basing our conclusions on the findings of previous systematic reviews, this review is necessarily limited by individual authors' decisions regarding the exclusion/inclusion of particular studies, further confounded by the fact that the standard of reporting, analysis and interpretation, whilst generally high, varied across the included papers. Third, our reliance on previous systematic reviews limits the immediacy of our findings as the most recent primary research is not included. Whilst our discussion sought to supplement the findings with the results from more recent primary studies, this approach was unsystematic. Fourth, we did not verify the information reported in the reviews by consulting individual studies, which may have introduced bias (e.g. resulting from inaccurate reporting of findings (Smith *et al.*, 2011)). However, the overlap in results, and broad agreement in responses to the questions posed by this review of reviews, suggests that our representation of the evidence is likely to limit potential bias.

## CONCLUSION

Despite the limitations identified above, this paper illuminates some commonalities across the existing evidence base. There remain unanswered questions around the effectiveness of brief alcohol intervention across different settings, different population groups, about the optimum intervention content, and the longevity of intervention effects. However, available evidence suggests that time-pressed clinicians looking for maximum impact with minimal input should direct their efforts to the delivery of short, simple interventions which focus on prompting individuals to record their alcohol intake, and that these are likely to be most effective in middle-aged, male drinkers.

## SUPPLEMENTARY MATERIAL

Supplementary material is available at *Alcohol and Alcoholism* online.

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