The effectiveness of brief interventions in the clinical setting in reducing alcohol misuse and binge drinking in adolescents: a critical review of the literature

Tracey Wachtel and Mabel Staniford

Aims and objectives. To investigate the effectiveness of brief interventions for adolescent alcohol misuse and to determine if these interventions are useful in reducing alcohol consumption. To determine if brief interventions could be used successfully by nurses in the clinical setting.

Background. Australian adolescents are consuming risky levels of alcohol in ever increasing numbers. The fiscal, health-related and social costs of this alcohol misuse are rising at an alarming rate and must be addressed as a matter of priority. Brief interventions have been used with some success for adult problem drinkers in the clinical setting. Brief interventions delivered in the clinical setting by nurses who are ‘on the scene’ are therefore a potential strategy to redress the epidemic of adolescent alcohol misuse.

Design. Literature review.

Methods. Multiple databases were searched to locate randomised controlled trials published within the past 10 years, with participants aged 12–25 years. Included studies used brief intervention strategies specific to alcohol reduction. Fourteen studies met these criteria and were reviewed.

Results. A range of different interventions, settings, participant age-ranges and outcome measures were used, limiting generalisability to the studied populations. No trials were carried out by nurses and only one took place in Australia. Motivational interviewing (one form of brief intervention) was partially successful, with the most encouraging results relating to harm minimisation. Long-term follow-up trials using motivational interviewing reported significant reductions in alcohol intake and harmful effects, but this may be partially attributed to a normal maturation trend to a steady reduction in alcohol consumption.

Conclusions. No single intervention could be confidently recommended due to confounding evidence. However, successful elements of past studies warrant further investigation. These include face-to-face, one-session, motivational interviewing-style brief interventions, focusing on harm minimisation and all with long-term follow-up.

Relevance to clinical practice. The introduction of brief interventions in the hospital setting has the potential to address the epidemic of adolescent alcohol misuse. Nurses are well placed to deliver these interventions, but a standardised approach is required to ensure consistency. Further research is urgently needed to ensure clinical practice is based on the best available evidence and to ensure findings are more relevant to Australian adolescents and to nurses in a clinical setting.

Key words: adolescent, alcohol misuse, binge drinking, brief intervention, motivational interviewing, nursing

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Introduction

Alcohol, when consumed heavily over a long period, can cause health problems including cirrhosis of the liver, brain injury, dementia and an increased risk of oesophageal, mouth and throat cancer (Beckham 2007). Alcohol misuse is also associated with depression, relationship difficulties and a decreased quality of life (Australian Bureau of Statistics [ABS] 2004–05). In Australia, alcohol, after tobacco, is the second highest cause of drug-related death and hospital admissions (Australian Institute of Health and welfare [AIHW] 2005a) and is outstandingly the main cause of road fatalities (ABS 2004–05).

The fiscal cost of alcohol abuse in Australia, taking into account a reduction in workdays, premature death and crime, has been estimated at about $15 billion annually (Collins & Lapsley 2008a). Furthermore, the healthcare cost of alcohol abuse is estimated at an alarming $2202 million annually (Collins & Lapsley 2008b). Alcohol has been found to be responsible for over 3100 deaths and 72 000 hospitalisations per year in Australia (Chikritzhs et al. 2003). This problem is increasingly affecting our adolescent population, with 3300 14–17 year-olds admitted to hospital for alcohol-related injury or disease between 1999–2000. Furthermore, between 1993–2002 an estimated 501 under-age drinkers died from injury or disease related to risky alcohol consumption – including ‘binge drinking’ (Child and Youth Health [CYH] 2008).

‘Binge drinking’ is defined as downing five or more standard drinks in one session (Perkins et al. 2001). This practice can lead to alcohol poisoning even death (CYH 2008). In Australia the proportion of 12–15 year-olds consuming risky levels of alcohol has doubled from approximately 2.5% in 1990 to approximately 5% in 2005. A significant increase in high-risk alcohol consumption has also been reported for 16–17 year-olds over the same time period – up from 15–20% (Roche et al. 2007). In addition, 3.4% of adolescents drink alcohol in high-risk amounts (AIHW 2005b).

Numerous interventions have been trialled to address alcohol misuse among adolescents (Larimer & Cronce 2002). While some primary prevention strategies have shown protective effects in terms of adolescent drinking (Botvin & Griffin 2004) other trials argue that primary strategies such as information and education alone do not result in decreases in alcohol consumption (Murphy et al. 2001). There is a clear need to expand prevention strategies to incorporate secondary prevention such as brief interventions and to target adolescents who are already problem drinkers (Murphy et al. 2001).

A brief intervention (BI) is described as an action that can motivate a person to change a problem-causing action (Hyman 2006). BI can last from 5–30 minutes and take the form of a discussion, a workbook, pamphlet or other means (Moyer et al. 2002). Some studies have reported positive results for brief interventions in reducing alcohol misuse among adults in an office-based setting (Fleming et al. 2002, Saiz et al. 2003), as well as in the clinical setting (Wilkinson et al. 1997, Crawford et al. 2004, Academic ED SBIRT Research Collaborative Group 2007). Brief motivational intervention is also starting to be recognised as an effective method for reducing alcohol use in college students (Larimer & Cronce 2002).

Motivational interviewing is one particular form of brief intervention that has been found to be effective in reducing alcohol intake and related risk-taking behaviour in adults (Beckham 2007). Motivational interviewing (MI) is ‘a client-centred, directive method for enhancing intrinsic motivation to change by exploring and resolving ambivalence’ (Monti et al. 2007, p. 1234). MI techniques include reflective listening, communicating respect and using open-ended questions to explore behaviour and focuses on clients’ strengths to make change (Beckham 2007).

Clinical settings may provide an ideal opportunity to reach adolescents in need of intervention for alcohol-related problems (Monti et al. 1999). Providing interventions in the clinical setting capitalises on a ‘teachable moment’ or a ‘window of opportunity’ (Barnett et al. 2002). Adolescents admitted to hospitals and/or emergency departments for alcohol-related emergencies may be particularly receptive to an intervention because the adverse event is current. The patient’s highly emotional and vulnerable state also makes them more receptive to health advice and recommendations (Academic ED SBIRT Research Collaborative Group 2007).

Aims

Adolescent alcohol misuse is increasing and subsequent admissions to hospital for alcohol-related injury or as a direct result of the effects of a binge-drinking episode are high. There are many potential opportunities to deliver brief interventions (BI) in the hospital setting and nurses are well placed to deliver these interventions. However, it is unclear if hospitals in Australia have a standard BI that nurses can confidently implement. A systematic review by Hyman (2006) on nurses’ delivery of BI for high-risk drinkers, found no meta-analyses addressing the issue and subsequently concluded that while brief interventions carried out by nurses are a legitimate task, little has been done to encourage, develop and/or define it. To develop a standard brief intervention we first need to establish if these interventions
are an effective device in the fight against adolescent alcohol misuse and binge drinking.

The aim of this paper is to review the effectiveness of brief interventions for adolescent alcohol misuse and binge drinking and to determine if they are useful in reducing alcohol consumption. This paper also aims to determine if brief interventions could be successfully used by nurses in a clinical setting.

Methods

The article search was conducted between August–October 2008 using the online databases CINAHL, Medline, Ovid full text, Ovid, PsycINFO and Cochrane. Search terms used were: ‘adolescent’, ‘young adult’, ‘binge drinking’, ‘alcohol’, ‘motivational interviewing’, ‘motivational intervention’ and ‘brief intervention’. The number of articles retrieved was initially 299 but only six met the inclusion criteria outlined below. Specific journals that informed the topic were also examined, including: *Psychology of Addictive Behaviour, Journal of Consulting and Clinical Psychology, Addictive Behaviours, The American Journal of Drug and Alcohol Abuse* and *Psychology of Addictive Behaviours*. Relevant review and study reference lists were also searched and subsequently yielded a further nine studies. Fourteen research studies that met inclusion criteria (as discussed below) were selected for the review.

Inclusion criteria

Inclusion criteria were as follows: studies needed to be Randomised Control Trials (RCT), to be published in English and to have included brief intervention strategies specific to alcohol, or alcohol-risk reduction. To represent the most up-to-date research, the included studies needed to have been published between 1998–2008. The participant age of 12–25 years was applied as an inclusion criterion in response to the inclusion age range of some of the trials. The authors predominately focused on the adolescent population, but included studies with older participants, up to 25 years, when there was a large age range that had included adolescents. Initially the search included only studies conducted in health care facilities, but this strategy found only five eligible trials. The inclusion criteria were therefore expanded to include colleges or universities and youth service centres.

Exclusion criteria

Studies were excluded if they were published prior to 1998, were not RCT’s, did not have a control group, the age fell outside of the 12–25 year criterion, or the sample age was not stated. Studies that used participants of up to 25 years, but did not include those less than 20 years were also excluded. One study (Collins & Carey 2005) met all inclusion criteria but failed to state the age range or the mean age of participants and so was excluded from the review. Papers that included substance use other than alcohol, or did not specifically target alcohol use-reduction or alcohol risk-reduction were also excluded, as were those that did not include an alcohol-reduction intervention. Community-based programs and family interventions were not included because of the difficulty in replicating them in an acute hospital setting.

Critique of the studies

The 14 studies included in this review were subject to critical appraisal using questions from the Critical Appraisal Skills Program (CASP) (Milton Keynes Primary Care Trust 2006). This tool assisted with recognising the validity and reliability of the design and appraising the strengths and weakness of the trials. The critical appraisal process of included studies is summarised in Tables 1 and 2.

In the 14 trials included in this review, 2114 participants, having been placed in either an Alcohol Intervention Group (AIG) or a control group (CG), were analysed. The review used studies from multiple settings, including four Hospital Emergency Departments (ED), seven Colleges or Universities, one Healthcare Clinic and one Youth Service Centre. Twelve studies were conducted in the USA, which included all of the

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<th>Table 1</th>
<th>Critical appraisal questions applied to the included studies</th>
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<tr>
<td>Q.1</td>
<td>Are the aims of the study clear?</td>
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<td>Q.2</td>
<td>Is this a randomised control trial (RCT) and is it appropriate?</td>
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<td>Q.3</td>
<td>Were the participants randomised to intervention or control groups?</td>
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<td>Was the sampling appropriate?</td>
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<td>Q.5</td>
<td>Were participants, staff &amp; study personnel ‘blind’ to participants’ study group?</td>
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<td>Q.6</td>
<td>Were participants in all groups followed-up and data collected in the same way?</td>
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<td>Did the study have enough participants to minimise the play of chance?</td>
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<td>Q.8</td>
<td>Were all the participants who started off in the study accounted for at the end?</td>
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<td>Q.9</td>
<td>Are the results clearly presented and are they appropriate?</td>
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<td>Q.10</td>
<td>Is this study relevant to your clients and/or practice?</td>
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College/University, ED and the Healthcare studies. One study took place in the Netherlands (High School) and one in Australia (Youth Service Centre). This highlights not only the general lack of studies conducted in Hospital and ED settings, but also in Australia. The studies were conducted by psychologists, psychiatrists, research scientists, behavioural scientists, medical doctors and PhD and Masters’ students of the afore-mentioned professions. Many of the trials were conducted by a multidisciplinary team. However, it is interesting to note that no trials were conducted by nurses and therefore results may not be generalisable to nurses undertaking the interventions.

Sample selection and sample size
Most studies required participants to meet a specific alcohol-consumption criterion to be included in the trial. One study included all volunteers, regardless of their alcohol intake (Bailey et al. 2004), while another conducted in an ED excluded intoxicated patients due to a perceived inability to be able to adequately complete the survey or intervention (Maio et al. 2005). The omission of this potentially important group may have altered the findings. Three of the college trials (Borsari & Carey 2000, Carey et al. 2006 & Feldstein & Forcehimes 2007) chose their sample from psychology students, which may have affected reporting and study findings, as participants quite possibly had greater insight into their own behaviour.

Two of the studies warned that results should be used with caution due to small sample size (Murphy et al. 2001 & Bailey et al. 2004). Participants’ ages varied in the trials. Adolescents can be placed into three groups, early (10–13 years), middle (14–16 years) and late adolescence (17–20 years) (Leifer & Hartston 2004). Three studies (Bailey et al. 2004, Boekeloo et al. 2004 & Spirito et al. 2004) included adolescents from all three adolescent age groups, while two others included only the middle and late adolescent groups in their studies (Maio et al. 2005 & Thush et al. 2007). A further two studies included only late adolescents (Feldstein & Forcehimes 2007 & Monti et al. 2007) while two others used late adolescents and older (Monti et al. 1999 & Carey et al. 2006). In the remaining trials, three stated a mean age (Borsari & Carey 2000, 2005 & Murphy et al. 2001) and two included participants who were younger than 19 years at selection (Marlatt et al. 1998, Baer et al. 2001).

The inconsistency of ages in the studies may have influenced the overall conclusion, as differing adolescent maturation stages could affect participants’ readiness for change and therefore influence trial results.

All studies accounted for each participant at the final follow-up (F/U). However, each trial reported an attrition rate, either at the end of the trial or at each F/U (for those with multiple F/Us). Monetary incentive for participation was offered in nine of the studies (Marlatt et al. 1998, Monti et al. 1999, 2007, Baer et al. 2001, Spirito et al. 2004, Borsari & Carey 2005, Maio et al. 2005, Carey et al. 2006 & Feldstein & Forcehimes 2007), with course credit given to participants in three of the studies (Murphy et al. 2001, Carey et al. 2006 & Feldstein & Forcehimes 2007).

### Table 2 Critical appraisal of reviewed studies

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<th>Studies</th>
<th>Q.1</th>
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<td>Murphy et al. 2001</td>
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can be assumed that this could introduce the possibility of bias, as under-reporting may occur when incentives are involved.

Study designs and collection of data
All studies included a control group; however, only eight of those were free of any kind of intervention (Marlatt et al. 1998, Borsari & Carey 2000, Murphy et al. 2001, Boekaello et al. 2004, Maio et al. 2005, Carey et al. 2006, Feldstein & Forcehimes 2007 & Monti et al. 2007). One study (Baer et al. 2001) used two control groups: one with high-risk drinking (the same as the intervention group) and the second was a normative group comprised of participants randomly selected from the entire screening pool – regardless of their drinking history. The high-risk control group received a degree of intervention, which was not given to the normative group, thereby making it difficult to accurately compare those findings.

Only six studies clearly stated they were blinded (Monti et al. 1999, 2007, Bailey et al. 2004, Boekaello et al. 2004, Spirito et al. 2004, & Feldstein & Forcehimes 2007). All studies used self-reporting to collect data from participants by using a set of specific questions (by interview or questionnaire) to help answer a research question (Taylor et al. 2006, p. 185). This data-collection method has several limitations, including questions that had not been fully understood or had been misinterpreted by participants, low return rates of questionnaires and the fact that group interviews may possibly reduce full and open disclosure (Taylor et al. 2006, pp. 220 & 233). Self-reported data may introduce potential bias with the subsequent risk of over- or under-reporting drinking levels and its effects (Taylor et al. 2006, p. 221). Only four trials had collateral verification (Marlatt et al. 1998, Borsari & Carey 2000, Baer et al. 2001 & Carey et al. 2006), which may have motivated participants to give more reliable responses.

Framework of review
A critical review framework was used to evaluate the studies. This framework assessed strengths, weaknesses and validity of the studies through explanation, interpretation and analysis (University of New South Wales [UNSW] 2008). As the studies had a range of different interventions, settings, participant-age ranges and outcome measures, no themes could be identified. Findings are therefore presented in three main sections determined by the time frame of research follow-up:
1. Interventions with short-term follow-up (up to six months),
2. Interventions with medium-term follow-up (6–12 months) and
3. Interventions with long-term follow-up (longer than 12 months). This is similar to the format used by Foxcroft et al. (2002). Results were tabled to enable analysis and synthesis of the findings from each study and they are presented in Table 3a–c.

Results

Interventions with short-term follow-up (Up to six months)
Five studies used short-term follow-up (Table 3a) and comprised of one Alcohol Intervention Group (AIG) and a control group. In-person follow-ups were conducted in three trials (Borsari & Carey 2000, Bailey et al. 2004, & Feldstein & Forcehimes 2007), telephone follow-ups in one (Borsari & Carey 2005) and one conducted follow-ups by both telephone (three months) and in person (six months) (Monti et al. 1999). Follow-up periods varied from six weeks (Borsari & Carey 2000)–six months (Monti et al. 1999 & Borsari & Carey 2005). All groups used Motivational Interviewing (MI) techniques and recorded partial success. The most encouraging results were related to harm minimisation, with a significant lowering of drink driving, traffic violations, alcohol-related injuries and problems in the MI group when compared to the control group (Monti et al. 1999 & Borsari & Carey 2005). ‘Harm minimisation’ refers to reducing the acute harms that occur with intoxication – including those of health, legal and social harms (Toumbourou et al. 2005). Monti et al. (1999) conducted their study in an ED and used MI, specifically aimed at reducing the harmful effects of alcohol, while Borsari and Carey (2005) aimed theirs at reducing alcohol use, as well as the alcohol-related problems. Feldstein and Forcehimes (2007) reported a reduction in alcohol-related problems in both groups, but the Alcohol Intervention Group (AIG) reduced problems more than in the control group. However, neither of the other two trials found a reduction in alcohol-related problems (Borsari & Carey 2000, Bailey et al. 2004).

Four Alcohol Intervention Groups (AIG) used a single MI session (Monti et al. 1999, Borsari & Carey 2000, 2005 & Feldstein & Forcehimes 2007) while one study required participants to attend four, 30-minute MI sessions, conducted in groups of 10 (Bailey et al. 2004). This latter study reported an increase in readiness to reduce alcohol consumption for the AIG and also decreased drinking frequency (while the control increased frequency) … but found that the number of drinks consumed per session was similar to the control and that there was no effect on risk-taking behaviour. A reduction in binge-drinking frequency was reported in two trials
| Interventions with (a) short-term follow-up (up to six months); (b) medium-term follow-up (6–12 months); (c) long term follow-up (longer than 12 months) |
|---------------------------------|-----------------|-----------------|-----------------|
| **Aims**                        | **Design/methods** | **Sample/settings** | **Major findings** | **Study rigour** |
| Bailey *et al.* 2004, Australia | To identify if a brief motivational interview and cognitive-behavioural-based alcohol intervention group program is feasible for young people at risk of developing a problem with alcohol and to assess short-term effectiveness of the intervention | 2 group RCT Control | $n = 34$ between 12–19 years, (17 female + 17 male) Recruited via recruitment-poster in a youth service centre of a low socio-economic area of New South Wales All volunteers were included regardless of current level of alcohol intake | AIG group showed increase in readiness to reduce alcohol consumption, pre-contemplation to contemplation stage Also reduced frequency of drinking at post-treatment and 1st F/U assessment, while control group reported increases at 2nd F/U No effect on risk-taking behaviour for AIG Control group increased hazardous drinking & frequency of binge drinking compared to AIG |
| Borsari & Carey 2005 NY: USA | To evaluate whether Brief Motivational Intervention (BMI) is superior to Alcohol Education (AE) in reducing referred students’ alcohol use and alcohol related problems | 2 group RCT Control AE group. Only factual AE given including risk reduction, no goal setting BMI group. Personalised feedback, AE related to individual, MI principles followed All | $n = 64$ (mean age $= 19$ 1 years) Students from 2 college campuses, referred to alcohol program, scoring 10 or more on an alcohol audit or had experienced 2 or more binge drinking episodes | Both groups decreased alcohol use BMI reduced alcohol-related problems more than AE that was sustained at six months BMI demonstrated more disclosure, engagement, collaboration & benefit than AE Information given in a non-judgemental setting may facilitate reductions |

Limitations
- Pilot study, facilitated by author of the treatment manual, who also conducted the post treatment assessment
- Small sample
- Short F/U period (two months)
- Not a blinded study.
- 2nd F/U coincided with Christmas – a socially accepted heavier-drinking period.
- No collateral verification, self-reported data

Strengths
- Collateral verification
- Random sessions audio taped to assess integrity
- Inter-rater reliability assessed

Limitations
- Study not blinded
- One Interventionist for both groups. May bias results
- Baseline & three month F/U was part of their obligation
- Monetary incentive at six month F/U
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<th>Aims</th>
<th>Design/methods</th>
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<th>Major findings</th>
<th>Study rigour</th>
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<tr>
<td>Borsari &amp; Carey 2000 NY: USA</td>
<td>To evaluate feasibility and acceptability of an hour-long Motivational Interviewing session with binge-drinking college students, attempting to replicate a past study &amp; examine mediating roles on perceived drinking norms with both positive &amp; negative alcohol experiences</td>
<td>2 group RCT Control No-treatment AIG BMI group. Baseline, customised intervention. 5-component intervention given All Six week face-to face F/U</td>
<td>Sample rated Brief Intervention a valuable experience Significant reductions in amount of alcohol consumed &amp; frequency of binge drinking in past month for BI group, but not in concurrent reduction of alcohol problems Further research needed on mediating roles</td>
<td>Strengths</td>
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<p>| Feldstein &amp; Forcehimes 2007 USA | To evaluate the impact of Brief Intervention on alcohol use in underage college drinkers and to examine the role of empathy and alliance with Motivational Interviewing (MI) | 2 group RTC Control No intervention, 15 minute study explanation only AIG MI group. One 45 minute, audio recorded session – option of extra alcohol use information. Debriefed at two month F/U All List of counselling services to use post F/U Two month face-to face F/U | n = 55 (aged 18–20 years) 78.2% female Volunteers from psychology students at a Uni Drink once in past month &amp; reported binge drinking at least once in past two weeks | At two month F/U both groups reduced alcohol-related problems but MI group more than Control Only MI had significant binge-drinking reductions Findings highlighted importance of MI availability to college students | Strengths | 3 Doctoral candidates who had MI training performed MI and were blind to sample Limitations | Small sample size Mostly women All Psychology students No collateral verification &amp; self-reported data Sample put into lottery, 10% received $50 gift certificate Unbalanced groups; 40 in MI &amp; only 15 in Control |</p>
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<th><strong>Aims</strong></th>
<th><strong>Design/methods</strong></th>
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<tr>
<td>To evaluate the use of brief Motivational Interviewing (MI) session to reduce alcohol-related consequences &amp; use among adolescents treated in ED after an alcohol-related event</td>
<td>2 group RCT</td>
<td>(n = 94) (age range 18–19 years)</td>
<td>At six months MI recipients had significantly lower drink driving incident, traffic violations, alcohol-related injuries &amp; problems than control</td>
<td>Strengths All interventionists given intensive MI training and had practice MI session videotaped Participants not approached until passed Mini-mental evaluation Baseline assessment &amp; intervention in private room, no family present F/U interview (three &amp; six months) by research assistants blind to treatment Limitations Monetary incentive given Modest sample size, narrow age range &amp; high refusal rate</td>
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<td>Monti et al. 1999, USA</td>
<td>Control</td>
<td>Presented at 1 hospital ED Positive blood alcohol content or a report of drinking prior to event causing treatment</td>
<td>Both groups had lower alcohol consumption</td>
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<td>Standard Care (SC) group was the general practice for treating Alcohol-induced teens and included a handout on avoiding drinking &amp; driving and list of local treatment agencies (five minutes) AIG Five part MI session (30–35 minutes), information on effects of alcohol on driving, &amp; personalised feedback sheet All Baseline assessment, F/U by telephone at three months and face-to-face F/U at six months, Handout on drink driving, &amp; alcohol effects &amp; list of treatment agencies (SC)</td>
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<td>3 group RCT</td>
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<td>Boekeloo et al. 2004, Washington: USA</td>
<td>Control</td>
<td>Recruited while seeing healthcare provider for general check-up Exit interview – alcohol beliefs &amp; self reported behaviour Setting included 5 managed care organisations and primary care practices</td>
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<td>To determine whether office-based Brief Motivational Intervention (BMI) alters adolescent’s beliefs and alcohol use</td>
<td>Group 1 – usual care &amp; exit interview AIG Group 2 – 15 minutes audio, self-assessment, exit interview Group 3 – same as Group 2, plus answer sheet &amp; support services All Telephone F/U interview at 6 &amp; 12 months</td>
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<td>AIG Group 2 – more binge drinking than group 3 at 30 days and three months Group 3 – had more resistance to peer pressure to drink AIG had more binge drinking than Control group Brief office-based BMI ineffective in reducing alcohol, but may increase adolescent reporting</td>
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<td>Study</td>
<td>Aims</td>
<td>Design/methods</td>
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<td>Carey et al. 2006, NY: USA</td>
<td>To evaluate the effectiveness of Brief Motivational Interventions (BMI) for at risk college drinkers</td>
<td>3 group RCT Control No treatment AIG Group 1 – Basic BMI-Personalised feedback, alcohol education &amp; goal setting Group 2 – Enhanced BMI (Basic BMI plus decisional balance exercise, which they took home) All Baseline timeline follow back interview (TLFB), 1, 6 &amp; 12-month mail &amp; face-to-face F/U</td>
<td>n = 509 (age range 18–25 years) 65% women 35% men Uni student volunteers Enrolled in intro psychology course</td>
<td>At one month, TFBI reduced consumption, but not problems Basic BMI improved all drinking outcomes beyond TLFB, but enhanced BMI did not Risk reduction was maintained throughout following year</td>
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<td>Maio et al. 2005, USA</td>
<td>To determine whether Emergency Department-based laptop computer intervention reduces normative age-related increase in alcohol misuse, compared with standard care</td>
<td>2 group RCT Control Standard care AIG Laptop-based interactive computer program with scenarios on alcohol misuse All Computer baseline questionnaire, 3 &amp; 12+ months telephone F/U</td>
<td>n = 655 (age range 14–18 years) Recruited from academic medical centre &amp; a teaching hospital Presented at ED within 24 hours post minor injury Intoxicated participants excluded</td>
<td>Intervention not effective in decreasing alcohol misuse among study population Binge drinking among AIG decreased at three months, but returned to baseline at 12 months</td>
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<td>Major findings</td>
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<td>Monti et al. 2007, USA</td>
<td>Efficiency of Brief Motivational Interviewing (MI) session compared to standard feedback in the Emergency Department (ED) for reducing alcohol use &amp; problems in young adults</td>
<td>2 group RCT Control Feedback only Baseline assessment &amp; one to three minute counsellor contact, feedback sheet, one &amp; three month telephone contact (5–10 minutes) AIG MI, telephone contact at one month (20 minute) and three months (25–30 minute). New feedback sheet mailed All 30–45 minute baseline assessment on computer, Given copy of feedback sheet, baseline assessment, 1, 3, 6 &amp; 12-month telephone F/U</td>
<td>$n = 198$ (age range 18–24 years) Alcohol positive on ED admit or Reported drinking 6-hrs prior to event initiating ED treatment or Scored 8 or higher on Alcohol Use Disorders Identification Test</td>
<td>At 12 months: MI participants drank on fewer days, had fewer heavy drinking days and fewer drinks per week in past month than feedback only Twice as many MI as Control reliably reduced alcohol intake from baseline to 12 months No difference in alcohol-seeking, treatment, injuries or violations</td>
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<td>Murphy et al. 2001, Auburn: USA</td>
<td>To evaluate efficacy of Brief Alcohol Screening and Intervention for College students (BASICS)</td>
<td>3 group RCT Control Assessment only AIG MI based intervention 1. BASICS – 50-minute individual sessions MI style, feedback sheet discussed &amp; info on drinking given 2. Education group – 50-minute individual sessions (30 minutes video &amp; 20 minutes discussion), info on drinking Both groups – feedback after baseline &amp; F/U All Three &amp; nine month face-to face F/U</td>
<td>$n = 84$ (mean age = 19.6 years) 54% female From same Uni. Screened using Alcohol Dependence Scale questionnaire Participants who were categorised in the upper 33% of ‘number of drinks-per –week’ were selected</td>
<td>At three months Nil significant differences, but heavier drinking – BASICS reduced weekly &amp; binge drinking At nine months Heavier drinking BASCIS participants showed greater reductions in weekly alcohol consumption &amp; binge drinking than did heavier drinking control and education participants BASICS rated more favourably than Educational group BASICS more efficacious than Educational interventions for heavier drinking college students</td>
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| Spirito *et al.* 2004, Santiago: USA  
To see whether a brief Motivational Intervention (MI) session would reduce alcohol-related consequences in an Emergency Department (ED) | 2 group RCT  
Control  
Standard Care, five minutes contact, advised to stop drinking  
AIG  
MI session covering 6 areas on alcohol related information  
Parents completed questionnaire and participants self-report on alcohol problems  
All  
45 minutes baseline assessment, handout on avoiding drink driving, three month (telephone) F/U and, 6 & 12 months (face-to-face) F/U | *n* = 152 (age range 13–17 years)  
Presented at 1 hospital ED  
Positive blood alcohol content on admission or  
Self-report of alcohol use  
6 hours prior to treatment in ED | At 12 months:  
Both groups reported reduced drinking quantity  
Alcohol related consequences remained low (all low at baseline)  
MI recipients had significantly more improvement on 2 of 3 outcomes compared with control group  
Future research needed to replicate findings  
MI has potential for clinically meaningful effect | Strengths  
F/U by Research Assistants blind to treatment group  
Prior to inclusion  
Participants needed to pass Mini-Mental Exam  
Not approached until Blood Alcohol Concentration <0·1 or had passed mini-menttal examination  
Limitations  
Monetary incentive  
Self-reporting with no collateral verification  
Conclusions limited due to refusal rate. Some participants missed a F/U |
| Thush *et al.* 2007, Netherlands  
To investigate the effectiveness of a ‘Learning to Drink’ intervention program in changing the cognitive determinates of drinking in a effort to moderate alcohol use & the development of alcohol-related problems in at-risk adolescents | 2 group RCT  
Control  
Information sheet only on alcohol effects, risk factors & consequences of heavy drinking  
AIG  
Seven weekly sessions (6 × 90 minutes group sessions (1 parent session) & 1 individual MI, including individualised feedback using BASICS)  
All  
Alcohol diary for seven weeks & several pre-test self-report questionnaires, 6 & 12 month F/U by mail | *n* = 107 (age range 14–18 years)  
61 male, 46 female  
High school students  
Average alcohol consumed by sample was 9·11 Dutch standard drinks  
77 participants reported 1 or more binge-drinking episode in past two weeks | Some effectiveness in changing several cognitive determinants of drinking  
However there was no significant difference in decreasing drinking in the AIG group compared to the Control group | Strengths  
4 councillors trained in MI & used same protocol (all masters or graduate students in psychology)  
Limitations  
Attrition rate 16%  
Relatively small sample, high refusal rate  
No collateral verification of self reported data |
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<th>Study Authors</th>
<th>Year</th>
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<th>Aims</th>
<th>Design/methods</th>
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<td><strong>Baer et al.</strong></td>
<td>2001</td>
<td>USA</td>
<td>To examine the long-term response to an individual preventive intervention for high-risk college drinkers relative to the natural history of college drinkers</td>
<td>3 group RCT Control 1. High-risk Control 2. Normative group Control AIG BI, baseline individualised feedback, information on reducing risks of alcohol, six month F/U (in person), MI over phone at two years F/U</td>
<td>All</td>
<td>$n = 348$, ($&lt; 19$ years at start of study) Enrolled in same large public Uni. Consuming 5–6 drinks in one session at least once in last month or experiencing at least 3 negative alcohol effects on 3–5 occasions over the last three years</td>
<td>Control Group Reduced drinking quantity &amp; negative effects, but no change in frequency BI Group Significant additional reductions, particularly in negative consequences Remission is normative BI for high-risk college drinkers can achieve long-term benefits, even in context of maturational trends</td>
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<td><strong>Marlatt et al.</strong></td>
<td>1998</td>
<td>USA</td>
<td>To evaluate efficacy of a Brief Intervention (BI) designed to reduce harmful drinking effects among high-risk college students</td>
<td>3 group RCT Control No-treatment, F/U, questionnaire &amp; interviews as per AIG group AIG BMI, Baseline 1 hour interview Given alcohol monitoring card, feedback interview, 40 high-risk participants given phone call Normative group ($n = 151$) all-risk levels, not in analysis, used for natural history comparison</td>
<td>All</td>
<td>$n = 348$ ($&lt; 19$ years at selection) 188 women, 160 men Senior year of high school all enrolled at same Uni. Screening questionnaire for high-risk students</td>
<td>At 2-year Assessment Reduction of drinking rates &amp; harmful effects in BMI group Both high-risk groups continue to have more alcohol problems than Normative group, but reduced their consumption over time This shows a ‘developmental maturation’ effect Women had greater decreases in drinking problems No predictive effect shown with parental alcohol problems More drinking &amp; associated problems in residential students</td>
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Interventions with medium-term follow-up (6–12 months)  
Interventions with medium-term follow-up comprised seven studies (Table 3b). Follow-up periods ranged from nine months (Murphy et al. 2001)–12 months (Boekeloo et al. 2004, Spirito et al. 2004, Maio et al. 2005, Carey et al. 2006, Monti et al. 2007 & Thush et al. 2007). Three trials compared two alcohol intervention groups (AIG) and a control group (Murphy et al. 2001, Boekeloo et al. 2004 & Carey et al. 2006). Of these, one used an audio program (Boekeloo et al. 2004) and reported it to be ineffective in reducing alcohol consumption, but found when provider prompting was also used (as in their second AIG), it increased adolescent reporting. This could indicate that face-to-face interventions are more effective with adolescents. The other two, three-group trials both used Motivational Interviewing (MI) in at least one of their AIGs. One study (whose AIG groups both used MI) reported reduced alcohol consumption but no reduction in associated problems (Carey et al. 2006). The other trial found no significant differences, although there was some reduction in both weekly and binge drinking in the AIG that used MI (Murphy et al. 2001), further highlighting the potential effectiveness of MI over other interventions.  
The remaining four studies had one Alcohol Intervention Group (AIG) and a control group (CG) (Spirito et al. 2004, Maio et al. 2005, Monti et al. 2007 & Thush et al. 2007). Of those, three used MI (Spirito et al. 2004, Monti et al. 2007 & Thush et al. 2007) but only one reported significant results – where twice as many AIG than CG participants reduced their alcohol intake from the baseline to the 12-month review (Monti et al. 2007). However, no difference was found in alcohol-related injury treatment or violations. One study ran two individual MI sessions (one at the beginning and one at the end) and then required participants to attend six, 90-minute group sessions (Thush et al. 2007). The trial reported no significant differences in decreased drinking in the AIG when compared to the control. Spirito et al. (2004) found that both groups lowered drinking quantity, but the group that had received MI had more improvement.  
One of the two group studies used a brief intervention other than motivational interviewing. Maio et al. (2005) used a laptop-based interactive computer program in an ED, where participants chose a cartoon character to play at a party and thereafter made decisions related to drinking. Their decisions resulted in different consequences and interactive feedback was provided at the end. No effective decrease in alcohol misuse was noted. Binge drinking did decrease in the Alcohol Intervention Group at three months, but returned to baseline at 12 months. It is unclear if the initial decrease was due to the intervention, which questioned their alcohol use, or as a result of the injury and reason behind their admission to the ED.  
Interventions with long-term follow-up (longer than 12 months)  
Two trials (Table 3c) provided long-term follow-up (Marlatt et al.1998 & Baer et al. 2001). Both had one AIG (providing a single Motivational Interviewing session) and a control group; but also included a second normative control group (chosen from the entire screening pool as a normative comparison). Baer et al. (2001) reported significant reductions in the negative consequences of high-risk drinking and in the quantity of consumption over the four-year follow-up. The greatest effect was found in a reduction of the negative consequences of drinking. It also found that the high-risk control group drinkers, although they continued to drink more than the normative group, steadily reduced the quantity of alcohol intake and associated problems over time. This may be attributed to a normal maturation trend whereby adolescents reduce high-risk drinking as they get older. This maturation trend was also evident in the second long-term study (Marlatt et al. 1998), which reported at the final two-year follow-up a reduction in drinking rates and harmful effects in the AIG, when compared to the no-treatment control group.  
Discussion  
The 14 studies included in this critical review used a range of different interventions over short, medium and long-term follow-ups, thereby confounding the findings. Varied settings, participant age ranges and a range of different outcome measures all had the potential to affect the outcomes of individual trials and therefore limit generalisability to the studied populations. Twelve studies used a Motivational Intervention (MI) style of intervention, seven of which reported reduced alcohol frequency and amount (Marlatt et al. 1998, Borsari & Carey 2000, Baer et al. 2001, Murphy...

Two studies that had held multiple Motivational Interviewing sessions for its participants reported no significant results in relation to alcohol misuse; however, they did find an increase in readiness to reduce alcohol intake (Bailey et al. 2004 & Thush et al. 2007). Both trials that used a brief intervention other than MI (Boekeloo et al. 2004 & Maio et al. 2005) found the intervention ineffective for reducing alcohol misuse for adolescents. It could be hypothesised from this result that MI is more effective in reducing adolescent alcohol misuse than the other brief interventions reviewed (which consisted of an interactive lap-top computer scenario and an audio-session scenario about alcohol misuse). However, as there were only two trials with which to make a comparison and because the MI studies had varying outcomes, it remains inconclusive.

The short-term follow-up studies all used Motivational Interviewing as an intervention and reported some positive results – especially in the area of harm minimisation. Binge drinking also reduced in two trials (Borsari & Carey 2000 & Feldstein & Forcehimes 2007) with some reduction in frequency and in the amount of alcohol consumed. The short follow-up period of these trials may have affected the findings, as there was only a limited time to assess the interventions. However, it can be concluded from these studies that MI interventions can have some success in reducing alcohol consumption and harm minimisation over the short term. The long-term follow-up trials both reported significant reductions in alcohol intake and harmful effects. However, they also found that a normal maturation trend contributed to a steady reduction in the quantity of alcohol consumption and its associated problems.

Overall, it is difficult to make a definitive conclusion on the effectiveness of any one Brief Intervention in reducing alcohol misuse and binge drinking among adolescents. Although most studies used motivational interviewing type brief interventions, no intervention designs were the same, making it difficult to recommend any particular one as being superior. It can be said that MI appeared to have more success than other brief intervention types and that even a single-session intervention can produce positive results. An important finding was that face-to-face delivery of the intervention might possibly be more effective for adolescents than audio or laptop-computer delivery.

Two earlier systematic reviews addressing the prevention of alcohol misuse by adolescents reported similar difficulties to those identified by this review. A lack of reliable evidence was reported more than 10 years ago by Foxcroft et al. (1997), who could not really recommend any one prevention program over another to prevent alcohol misuse. A more recent review by the same authors (Foxcroft et al. 2002) found that culturally-based interventions, as well as The Strengthening Families program by Spoth (2000, cited in Foxcroft et al. 2002) had potential value; however, they would both be difficult to replicate in an acute hospital setting. They also recommended an international register be established on drug and alcohol prevention interventions, complete with ratings in terms of their relative safety, efficacy and effectiveness (Foxcroft et al. 2002).

Implications for nursing practice and further research

Health care settings provide an ideal opportunity to reach adolescents who are in need of intervention for their alcohol misuse (Monti et al. 1999). Adolescents admitted for alcohol-related emergencies may be particularly receptive to an intervention because of the current nature of the event and the patient’s highly emotional state (Monti et al. 1999). Brief interventions (including motivational interviewing) are particularly suited to the emergency department and hospital setting due to their brevity. The intervention combines personal feedback with an empathetic approach (Miller & Rollnick 2001), both of which are well in a nurse’s scope of practice. Any admission to the Emergency Department due to alcohol-misuse/alcohol-induced injury or illness, therefore, provides an ideal opportunity to reach adolescents who may benefit from an intervention.

The diversity of interventions discussed in this review makes it difficult to recommend one as superior to the others. Further research comparing similar interventions, settings and trial designs is therefore required to evaluate their effectiveness and to assist with the development of a standardised intervention in Australian hospitals. Qualitative studies could also be useful to investigate; that is, from the perspective of the adolescent, why some interventions are more effective than others and thereby providing greater insight into the development of a truly successful intervention. In particular, nursing research conducted in Australia is needed to ensure that the findings are relevant to Australian adolescents and to our nurses in the clinical setting.

Although this paper is unable to endorse any of the reviewed studies confidently, it can, however, recommend
elements to be included in trial designs for future research. These are: face-to-face, one-session, motivational interview-style brief interventions aimed at harm minimisation and using long-term follow-up. It could be hypothesised that by combining these elements into one intervention, a successful outcome in reducing alcohol use and minimising harm among adolescents could be attained.

Conclusion

In Australia the number of adolescents consuming risky levels of alcohol is increasing at an alarming rate, with the number of adolescent hospital admissions as a result of alcohol-related injury or disease becoming extremely high. These admissions create many opportunistic moments to conduct brief interventions in the hospital setting, with nurses being well placed to deliver them. Described as an action that can motivate a person to change a problem-causing action, Brief Interventions have been found to incorporate a legitimate role for nurses, but little has been done to develop and define this role. Adolescents admitted to an Emergency Department with alcohol-related issues usually have only a short stay. Any intervention used by nurses in a clinical setting needs to be simple, quick, effective and inexpensive and to be based on the best available evidence. Further Australian research is urgently needed to ensure recommendations are relevant to Australian adolescents and nurses in a clinical setting, so that we can begin to address the alarming social and financial cost of teenage binge drinking.

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Contributions

Study design: MS; data collection and analysis: MS & TW; manuscript preparation: TW & MS.

Conflict of interest

There were no conflicts of interest in the preparation and writing of this paper.

References


to Reduce the Social Costs of Alcohol, National Drug Strategy Monograph Series No. 70, Commonwealth of Australia, Canberra.


