

Online school-based prevention for alcohol and other drugs: A systematic review

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Background

- Alcohol and drug use among adolescents is a major public health concern, and is associated with considerable social costs and harms (Begg *et al.*, 2003).
- Data from the 2010 National Drug Strategy Household Survey indicate that in Australia:
 - 25% of 14-19 year olds have tried an illicit drug
 - Almost 20% have consumed alcohol at a risky level in the past month (AIHW, 2010)
- These results highlight a **clear need for prevention**. Many school-based prevention programs for alcohol and drugs exist, however the efficacy of these interventions has been limited (Foxcroft & Tsertsvadze, 2011). This is most likely due to implementation and dissemination barriers.
- Interventions delivered via computers or the Internet have the potential to overcome many of these barriers by offering:
 - High implementation fidelity
 - Reduced dissemination costs
 - Increased accessibility & availability



AIM: To identify Internet and computer-based prevention programs for alcohol and other drugs delivered in schools, and to determine the efficacy of these programs.

Method

Data Sources and Study Selection

- The Cochrane Library, PsycINFO and PubMed databases were searched in March 2012.
- Inclusion Criteria:** studies needed to be an Internet- or computer-based prevention program for alcohol or other drugs, delivered in a school setting.
- Figure 1 shows the search strategy and study selection process used.

Study Quality

- Quality was assessed using a validated measure for rating study quality (Jadad, 1996).
- Studies were rated against 3 key criteria, on a scale from 0-5*: 1) *randomisation*, 2) *double-blinding*, 3) *withdrawals and drop-outs*.
- *School-based interventions rarely receive scores above 3 as double-blind conditions and full randomisation are often not possible (Neil & Christensen, 2009).

Outcome Measures

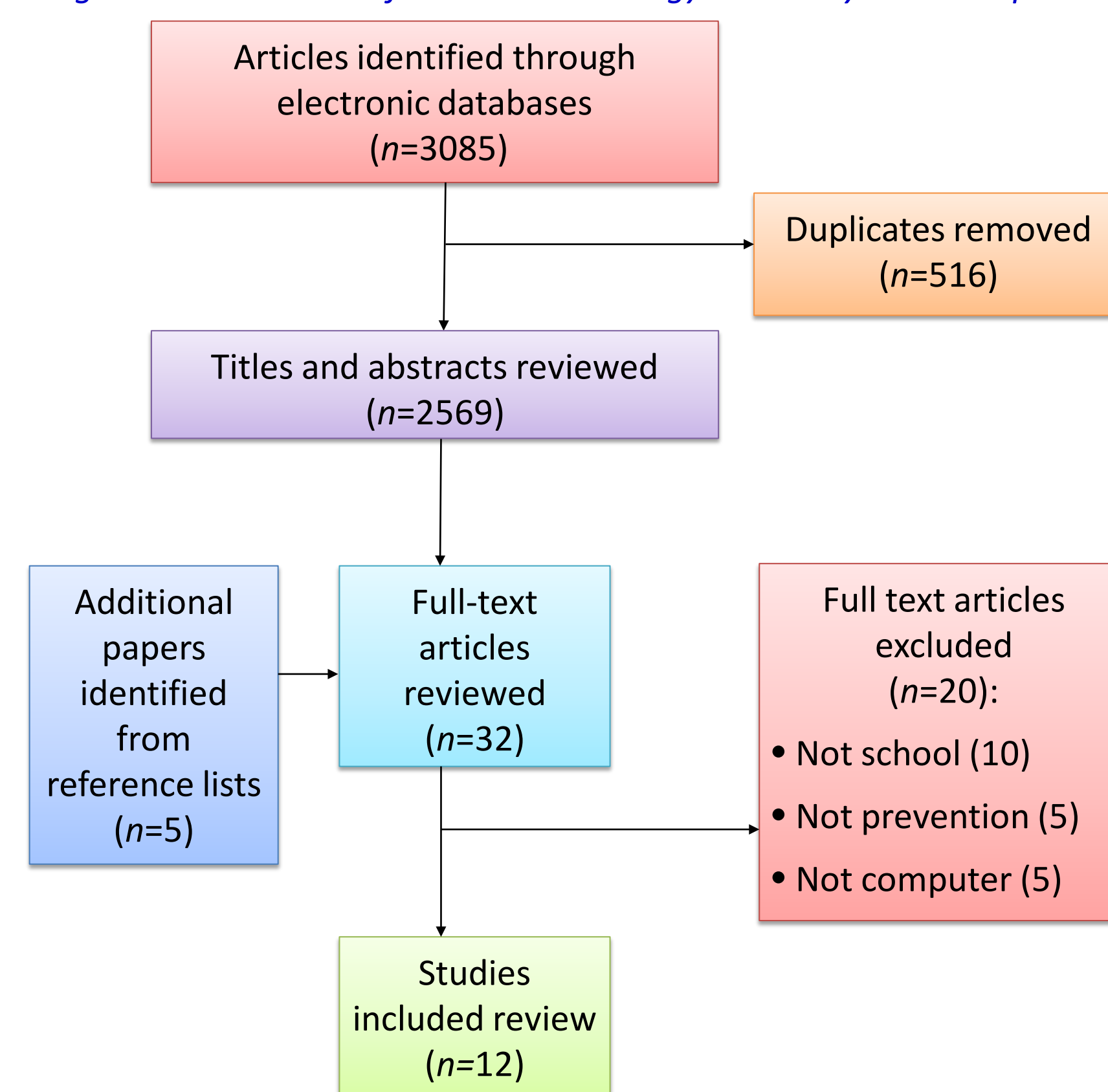
- Primary outcomes:** Alcohol and drug use
- Secondary outcomes:**
 - Alcohol and drug-related knowledge
 - Attitudes and expectancies
 - Harms caused by one's own use
 - Intentions and temptations to use
 - Resistance skills and decisional balance



Analysis

- Effect Sizes (ES) are reported for continuous outcomes, and Odds Ratios (OR) for dichotomous outcomes.
- Due to the small number of studies and study heterogeneity, it was not possible to conduct a formal meta analysis ∴ **a systematic review was conducted**

Figure 1: Flow chart of the search strategy and study selection process



Results

Table 1: Primary and secondary outcome data for identified trials

Program	Trial	Substance	Sample	Intervention	Substance Use Post-intervention ES/OR	Substance Use Follow-up ES/OR	Secondary Outcomes Post-Intervention & Follow-up ES/OR	Quality Rating	
Consider This	Buller <i>et al.</i> , 2008	Tobacco	Australia, 10-16yrs, n=2077	Online, 6 lessons	30-day smoking prevalence (whole cigarette), ES 0.05* (INT<CO)	-	Future smoking intentions PI, OR 0.01	2	
		Tobacco	USA, 10-14yrs, n=1234	Online, 6 lessons	30-day smoking prevalence (whole cigarette), ES 0.23	-	Future smoking intentions PI, OR 0.13* (INT<CO)	2	
Smoking Zine	Norman <i>et al.</i> , 2008	Tobacco	Canada, 14-16yrs, n=1402	Online, 5 stages	Cigarette use, OR 1.27; Cigarette use among non-smokers, OR 0.79* (INT<CO)	-	Resistance (whole sample), OR 1.03 and resistance among baseline smokers, OR 1.22* (INT>CO); Behavioural intentions to smoke, OR 1.04 and behavioural intentions among baseline smokers, OR 0.82* (INT<CO)	3	
ASPIRE	Prokhorov <i>et al.</i> , 2008	Tobacco	USA, 15-16yrs, n=1574	CD-ROM, 5 lessons + booster	-	Smoking initiation, OR 2.87* (INT<CO); Cigarette smoking behaviour, ES 0.12* (INT<CO), both at 18mth F/U	Decisional balance, ES 0.25* (INT>CO); Temptation to smoke, ES 0.20* (INT<CO); Self-efficacy, ES 0.02; Resistance skills, ES 0.26, all at 18mth F/U	2	
CLIMATE Schools: Alcohol	Vogl <i>et al.</i> , 2009	Alcohol	Australia, 13yrs, n=1466	CD-ROM, 6 lessons	Average alcohol consumption, ES 0.25; Binge drinking, ES 0.11	Average alcohol consumption at 6mth F/U, ES 0.24* and 12mth F/U, ES 0.23* (INT<CO for females only); Binge drinking at 6mth F/U, ES 0.20* and 12mth F/U, ES 0.20* (INT<CO females only).	Alcohol knowledge PI, ES 1.33* (INT>CO), 6mth F/U, ES 0.73, and 12mth F/U, ES 0.52; Alcohol harms PI, ES 0.22, 6mth F/U, ES 0.08, and 12mth F/U, ES 0.20* (INT<CO for females only); Alcohol expectancies PI, females, ES 0.20*, and males, ES 0.30*, and 12mth F/U, females, ES 0.41*, and males, ES 0.30*, (INT<CO).	3	
		Alcohol	Australia, 13yrs, n=764	Online, 6 lessons	Average alcohol consumption, ES 0.09* (INT<CO); Binge drinking, ES 0.06	Average alcohol consumption at 6mth F/U, 0.09; Binge drinking at 6mth F/U, ES 0.05	Alcohol knowledge PI, ES 0.93*, at 6mth F/U, ES 0.69* (INT>CO); Alcohol harms PI, ES 0.05, and 6mth F/U, ES 0.08; Alcohol expectancies PI, ES 0.21 and 6mth F/U, ES 0.20	2	
CLIMATE Schools: Alcohol & Cannabis	Newton <i>et al.</i> , 2009b	Alcohol, cannabis	Australia, 13yrs, n=764	Online, 6 lessons	Average alcohol consumption, ES 0.18; Binge drinking, ES 0.90; Frequency of cannabis use, ES 0.18	Average alcohol consumption at 6mth F/U, ES 0.16* and 12mth F/U, ES 0.38* (INT<CO); Binge drinking at 6mth F/U, ES 0.05 and 12mth F/U, ES 0.17* (INT<CO); Frequency of cannabis use at 6mth F/U, ES 0.19* (INT<CO) and 12mth F/U, ES 0.31	Alcohol knowledge PI, ES 0.79*, 6mth F/U, ES 0.75* and 12mth F/U, ES 0.76* (INT>CO); Cannabis knowledge PI, ES 0.78*, at 6mth F/U, ES 0.56* and 12mth F/U, ES 0.61* (INT>CO); Alcohol harms PI, ES 0.25, at 6mth F/U, ES 0.04 and 12mth F/U, ES 0.26; Cannabis harms PI, ES 0.12, at 6mth F/U, ES 0.04 and 12mth F/U, ES 0.12; Alcohol expectancies PI, ES 0.35, at 6mth F/U, ES 0.16 and 12mth F/U, ES 0.3; Cannabis attitudes PI, ES 0.04, at 6mth F/U, ES 0.03 and 12mth F/U, ES 0.21.	3	
Combined PAS	Koning <i>et al.</i> , 2009	Alcohol	Netherlands, 12-13yrs, n=3368	Online, 4 lessons and/or parent education	Onset of heavy weekly alcohol use at 10mth F/U, OR 0.36*, 22mth F/U, OR 0.80 and 34mth F/U, OR 0.69* (INT<CO); Onset of weekly alcohol use at 10mth F/U, OR 0.67*, 22mth F/U, OR 0.71* and 34mth F/U, OR 0.69* (INT<CO); Frequency of monthly drinking at 10 and 22mth F/U†			-	3
					Weekly smoking at 24mth F/U, OR 1.06; Positive change of stage at 24mth F/U, OR 1.25				
TTM	Aveyard <i>et al.</i> , 2001	Tobacco	UK, 13-14yrs, n=8352	CD-ROM, 3 lessons	-	-	-	2	
Head On	Marsch <i>et al.</i> , 2007	Tobacco, alcohol, cannabis	USA, 12yrs, n=272	CD-ROM, 15 lessons	Frequency of smoking*† (INT>CO); Frequency of drinking†; Frequency of marijuana use†	-	Drug-related knowledge*† (INT>CO); Intentions to use alcohol, cigarettes and marijuana†; Attitudes towards drug use†; Likelihood of refusal†	0	
Refuse to Use	Duncan <i>et al.</i> , 2000	Cannabis	USA, 15yrs, n=65	CD-ROM, 1 lesson	-	-	Efficacy to refuse marijuana*† (INT>CO); Intention to refuse*† (INT>CO)	3	
Drugs 4 Real	Lord & D'Amante, 2007	Alcohol, cannabis, tobacco	USA, 12-14yrs, n=295	Online, 6 visits	Drug-related knowledge*† (INT>CO); Intentions to use alcohol, cigarettes and marijuana†; Attitudes towards drug use†; Likelihood of refusal†	-	-	1	

F/U, follow-up; ES, effect size; OR, odds ratio; CO, control group; INT, intervention group; PI, post intervention; Mth, month. For each trial, ES and ORs are reported at post-intervention and/or each follow-up occasion. For the Norman *et al.* trial, the ORs reported by the authors were averaged across post-intervention, 3 month and 6 month scores. In the Koning *et al.* study, only the combined parent/student intervention was significantly different from the control group. For the Aveyard *et al.* study, positive change of stage was defined as a movement to a stage where acquisition of smoking was less likely, or cessation more likely. * Significant difference at p<0.05 between intervention and control; † Authors were contacted, but effect size was unable to be calculated

Discussion

- Overall 12 trials of 10 programs were identified, and ES and/or ORs were obtained for 7 programs. Of the 7 programs:
 - 6 achieved a reduction in alcohol or drug use
 - 2 decreased intentions to smoke
 - 2 increased alcohol or drug-related knowledge
- The greatest effects were achieved for drug and alcohol-related knowledge, with effectiveness persisting at 6- and 12-month follow-ups for 3 trials.
- ES and ORs were small for drug and alcohol use and secondary outcomes. However, these compare favourably to effects reported for non-computerised school-based prevention programs (Teesson, Newton & Barrett, 2012) and Internet-based treatment programs for young adults (Tait & Christensen, 2010). *ES for drug and alcohol prevention typically fall between 0.2 – 0.3
- This was the first review to focus specifically on computer- and Internet-based programs for the prevention of alcohol and drugs in schools.
- Only 2 of the 10 programs had been evaluated more than once, highlighting a clear need for the cross validation of existing programs.
- Although the number of trials identified in this review is small, the results have major implications for the delivery of alcohol and drug prevention in schools.



Internet- and computer-based programs can be an effective means of delivering drug and alcohol prevention in schools!

Conclusions

The present results, together with the implementation advantages and high fidelity associated with new technology, suggest that programs facilitated by the Internet offer a promising delivery method for school-based prevention.

Acknowledgements & Contact

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