Internet-based interventions for young people with problematic substance use: a systematic review
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CRD summary
This review concluded that web interventions that targeted alcohol-related problems had an effect about equivalent to brief in-person interventions and could be delivered to a larger proportion of the target population. Methodological limitations such as a lack of quality assessment and potential for missed studies mean that the authors’ conclusions should be interpreted with caution.

Authors’ objectives
To determine the effectiveness of web-based interventions for problematic substance abuse by adolescents and young adults.

Searching
MEDLINE, PsycINFO and Current Contents were searched to February 2009. Search terms were reported. References from included studies and relevant reviews and key journals were handsearched. The review was restricted to English-language studies.

Study selection
Randomised controlled trials (RCTs) that compared a fully automated web-based intervention to a no-treatment or active control in adolescents or young adults (25 years and under) and that reported a measure of consumption of the target substance were eligible for inclusion. Studies that assessed only changes in attitude or that were delivered via standalone computer or CD ROM were excluded.

Most studies of young adults involved tertiary students; one included young employed adults. All studies targeted alcohol consumption; one also targeted other types of health behaviour (physical inactivity and low fruit and vegetable intake). Some studies included only people with alcohol-related problems; others included participants with all levels of alcohol use including some who were non-drinkers.

Outcomes assessed included heavy drinking, “felt drunk”, negative consequences of drinking, alcohol consumption (units per occasion, per week, frequency, peak drinking, drinking to intoxication, binge drinking, weekend drinking, quantity), CAGE (Cut down, Annoyed, Guilty, Eye-opener) score, high-risk behaviour, protective behaviour, harm experienced, alcohol-related problems, academic problems and Alcohol Use Disorders Identification Test (AUDIT) score. Most studies reported only short-term outcomes (less than three months); four studies reported outcomes at four months or longer.

One reviewer assessed studies for inclusion.

Assessment of study quality
The authors did not formally assess study quality.

Data extraction
Data were extracted to calculate effect sizes (d) and 95% confidence intervals (CIs). These were calculated as between-group differences at follow-up divided by pooled standard deviation from baseline data. Where baseline data were unavailable, pooled standard deviations from the outcome results were used. Where studies reported median and ranges, means and standard deviations were calculated using the method of Hozo et al.

The authors did not state how many reviewers performed data extraction.
Methods of synthesis
Summary effect sizes were calculated using random-effects models for all outcomes combined and separately for three key outcome measures. Heterogeneity was assessed with the Q statistic. Where significant heterogeneity was present, cluster analysis was used to identify potential outliers.

Results of the review
Fourteen studies (n=7,082) were included. One study was excluded from the meta-analysis as it reported outcome data as change scores subdivided by gender.

Overall the intervention was associated with a significant beneficial effect (d=-0.22, 95% CI -0.34 to -0.10). There was substantial heterogeneity (p<0.001). The web-based intervention was also associated with a significant reduction in quantity of alcohol consumed (d=-0.12, 95% CI -0.22 to -0.02; 10 studies), frequency of binge drinking (d=-0.35, 95% CI -0.64 to -0.06; seven studies) and negative consequence of alcohol consumption as measured by the Rutgers Alcohol Problem Index or Alcohol Problems Scale (d=-0.57, 95% CI -0.98 to -0.15; six studies). There was no evidence of heterogeneity for the quantity of alcohol consumed (p=0.60), but there was substantial heterogeneity for the other two outcomes (p<0.001). Cluster analysis suggested possible outlying studies, but reasons for these outliers were not assessed. Two studies reported data separately for non-drinkers at baseline. These studies found no significant effect of the intervention.

Two studies assessed interventions aimed at smoking behaviour in adolescents. Methodological differences meant that meta-analysis was not conducted and results were not presented.

Authors' conclusions
Web interventions that targeted alcohol-related problems had an effect about equivalent to brief in-person interventions, but with the advantage that they could be delivered to a far larger proportion of the target population. Web-based interventions to prevent development of alcohol-related problems in those who did not drink appeared to have minimal impact.

There were insufficient data to assess the effectiveness of web-based interventions for tobacco use by adolescents.

CRD commentary
The review answered a focused question. Inclusion criteria were defined. The literature search was adequate for published studies. The restriction to studies in English and a lack of specific attempts to locate unpublished studies raised the possibility of language and publication biases. No appropriate steps were taken to minimise bias during study selection. The number of reviewers involved in data extraction was unclear. Study quality was not formally assessed and the risk of bias in the included studies was unclear. Appropriate methods were used to pool data, but presenting results as effect sizes made it difficult to interpret the clinical significance of the results. Substantial heterogeneity was not fully explored. Although two studies were identified that assessed smoking behaviour in adolescents, no details of these were presented as the authors stated that the studies were unsuitable for meta-analysis. It would have been more informative to have conducted a narrative synthesis of these studies.

Methodological limitations mean that the authors' conclusions should be interpreted with caution.

Implications of the review for practice and research
Practice: The authors stated that web-based interventions had potential to provide intervention at a population level.

Research: The authors did not state any implications for research.

Funding
Centre for Mental Health Research, Australian National University.
Bibliographic details

PubMedID
20528701

Original Paper URL

Indexing Status
Subject indexing assigned by NLM

MeSH
Adolescent; Alcohol-Related Disorders /therapy; Humans; Internet; Telemedicine /methods; Tobacco Use Disorder /therapy; Young Adult

AccessionNumber
12010006161

Date bibliographic record published
26/01/2011

Date abstract record published
13/07/2011

Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.