Can stand-alone computer-based interventions reduce alcohol consumption? A systematic review

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CRD summary
The authors tentatively concluded that computer-based interventions may be more effective than minimally active comparator groups at reducing weekly alcohol consumption in student and non-student populations and binge-drinking in student populations. This was a well-conducted review and the authors’ cautious conclusion is likely to be reliable.

Authors’ objectives
To evaluate the effects of computer-based interventions to reduce alcohol consumption in adults.

Searching
MEDLINE, EMBASE, CINAHL, PsycINFO, ERIC, Web of Science and IBSS were searched from inception to December 2008. There were no language restrictions. Search terms were reported. Conference proceedings and theses were searched for unpublished data. Reference lists of reviews and included articles were scanned to identify further studies.

Study selection
Randomised controlled trials (RCTs) that evaluated standalone (non-guided) computer-based interventions aimed at reduced alcohol intake in adults (aged at least 18 years) with any level of current consumption were eligible for inclusion. The primary comparators of interest were minimally active interventions (assessment only, usual care, non-tailored information and education); other eligible comparators were active interventions (brief interventions).

Most studies were conducted in USA and one was in UK. Students represented a large proportion of the study population. Many interventions were delivered via the Internet and contained personal feedback on levels of safe drinking; others included interactive games and more extensive content based on established behavioural change components and theoretical frameworks. Intervention intensity varied; some encouraged multiple exposure. Various screening tests and cut-off scores were used. The chosen outcomes for analysis were total alcohol consumption (grams per week) and number of binge-drinking episodes (author definitions of binge-drinking) using the farthest reported point of follow-up.

Two independent reviewers carried out the study selection. Discrepancies were resolved by involvement of a third party.

Assessment of study quality
Trial quality was assessed on the basis of allocation concealment and studies were graded as having high, low or unclear risk of bias.

One reviewer carried out the quality assessment and this was checked by a second reviewer. Discrepancies were resolved by involvement of a third party.

Data extraction
Data were extracted or transformed to present mean differences and 95% confidence intervals (CI). In some studies, medians and ranges were used to estimate means and standard deviations. Authors were contacted for missing data.

One reviewer extracted data and these were checked by a second reviewer.

Methods of synthesis
Mean differences were weighted (WMD) by the inverse-variance method and pooled in a random-effects meta-analysis. Separate analyses were carried out for the two comparisons of interest. Statistical heterogeneity was assessed with $X^2$ and $I^2$. Subgroup analysis was carried out for student versus non-student populations. In an attempt to assess the influence of skewed data, a sensitivity analysis was carried out using studies that reported appropriate measures of central tendency in accordance with the data distribution.

**Results of the review**

Nineteen RCTs (n=4,545 participants, sample size range 40 to 1,136) were included in the meta-analysis. Three trials were classed as having a low risk of bias and the other studies were unclear. Follow-up was three months or less in most studies (range two weeks to 12 months).

**Total alcohol consumption:** In comparison with minimally active interventions, computer-based interventions significantly reduced weekly alcohol consumption in student and non-student populations (WMD -25.9g, 95% CI -41 to -11; 16 RCTs). The change equated to 3.24 UK units of alcohol. The effect was more pronounced in the non-student population (WMD -114.94g, 95% CI -198.60 to -31.29; four RCTs). There was substantial heterogeneity in both analyses ($I^2=62\%$ and $I^2=77\%$). Five studies (n=994 students) with more appropriate measures of central tendency were analysed separately and showed no significant difference between the intervention groups. There was no significant difference between computer-based interventions and active comparators (three RCTs, $I^2=0\%$); this analysis was heavily influenced by one trial.

**Binge drinking:** Compared with minimally active interventions, computer-based interventions were associated with a reduction in the frequency of binge-drinking in student populations (WMD -2.3 days/week, 95% CI -0.47 to 0.00, $I^2=0\%$; five RCTs). Pooled analysis of the comparison with active interventions was not possible, but two trials separately indicated no significant difference.

**Authors’ conclusions**

Computer-based interventions may be more effective than minimally active comparator groups at reducing weekly alcohol consumption in student and non-student populations and binge-drinking in student populations. This conclusion was tentative due to methodological weaknesses in the studies.

**CRD commentary**

The review question was clear and supported by reproducible inclusion criteria. The search strategy included several relevant sources of published and unpublished data. Attempts were made to minimise language bias. The authors justified the limited use of available quality assessment criteria. The authors’ recommendation for further consideration of quality assessment of studies in this topic area appeared appropriate. The review process was carried out with efforts to minimise error and bias. The chosen method of synthesis was matched appropriately to the results for statistical heterogeneity. Study details were clearly presented.

The authors' tentative conclusion is likely to be reliable.

**Implications of the review for practice and research**

**Practice:** The authors did not state any implications for practice.

**Research:** The authors stated that future research should report appropriate measures of central tendency due to potentially skewed data on alcohol consumption. Risk of bias components relevant to online trials and computer-based interventions should be identified.

**Bibliographic details**


**PubMedID**
21083832

DOI
10.1111/j.1360-0443.2010.03214.x

Original Paper URL

Indexing Status
Subject indexing assigned by NLM

MeSH
Adolescent; Adult; Alcohol Drinking /adverse effects /prevention & control; Alcoholic Beverages /statistics & numerical data; Bias (Epidemiology); Data Interpretation, Statistical; Ethanol /poisoning; Female; Humans; Male; Psychotherapy, Brief /methods; Randomized Controlled Trials as Topic; Research Design; Students /psychology /statistics & numerical data; Therapy, Computer-Assisted; Treatment Outcome

AccessionNumber
12011001623

Date bibliographic record published
18/05/2011

Date abstract record published
05/10/2011

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.