

## Online interventions for social marketing health behavior change campaigns: a meta-analysis of psychological architectures and adherence factors

*Cugelman B, Thelwall M, Dawes P*

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### CRD summary

The authors concluded that online interventions could influence change in voluntary behaviours routinely targeted by social marketing campaigns, and have the advantages of low cost and broad reach. The conclusions regarding cost and reach are not reflected in the evidence presented and some potential methodological weaknesses in this review means that the reliability of this conclusion is unclear.

### Authors' objectives

To evaluate the effectiveness of online interventions to achieve population-wide change in voluntary lifestyle behaviours. The review also looked at the moderating effects of intervention design, and the influence of study and intervention adherence (these areas do not form part of this abstract).

### Searching

PubMed, PsycINFO, The Cochrane Library and Web of Knowledge were searched for studies in English from 1999 to 2008. Search terms were reported. Further studies, including grey literature, were sought from the bibliographies of relevant meta-analyses, discussion forums and various Internet sources.

### Study selection

Experimental (randomised and non-randomised) and quasi-experimental studies of primarily web-based or web- and email-based interventions that targeted individuals older than nine years were eligible for inclusion. The authors needed to extract effect size statistics for behaviour change across health, safety, environmental and community development domains. Control groups had to contain print, web-based interventions, wait-lists, placebos or therapists.

A variety of participants were described (students, military personnel, diabetics, smokers, overweight individuals, church congregation), with a mean age of 34.7 years (range 15 to 62 years). Most were white and had a university degree. Many interventions were personalised and informed users about the consequences of their behaviour, helped set and achieve goals, encouraged skills learning and provided feedback. Where reported, study adherence ranged from 21.2% to 100%; intervention adherence ranged from 26% to 100%.

The authors did not state how many reviewers selected the studies.

### Assessment of study quality

A modified version of the 27-item Downs and Black checklist was used to assess the quality of randomised and non-randomised studies. Results were presented as a percentage research score.

The authors did not state how many reviewers carried out the quality assessment.

### Data extraction

Data were extracted to enable the calculation of effect sizes and 95% confidence intervals (CI). The data were coded on an outcome measure that best reflected the behaviour change of interest. Authors were contacted for clarification where necessary. Pre- and post-intervention data were available in many studies.

Data were initially coded and confirmed later by one reviewer.

### Methods of synthesis

Effect sizes were pooled in a random-effects meta-analysis with inverse variance weighting. Statistical heterogeneity was assessed with Q and I<sup>2</sup>. The influence on effect size of study quality, intervention duration and delivery was explored. Publication bias was assessed with a funnel plot.

### Results of the review

Twenty-nine studies (30 interventions) that contained 17,524 participants were included in the review. Twenty-four studies were randomised, one was non-randomised and the remainder were unclear. Follow-up was completed by 14,895 participants. Research scores ranged from 38.5% to 96.2%.

Overall, a statistically significant pooled effect size was achieved in favour of the online interventions (standardised mean difference 0.194, 95% CI 0.111 to 0.278; 30 studies). There was significant heterogeneity (I<sup>2</sup> = 54.8%). Online interventions showed the greatest effect when compared with wait-lists and placebos (0.282, 95% CI 0.170 to 0.393; 18 studies; I<sup>2</sup> = 69.2%); and a smaller effect when compared with lower-tech online interventions (0.162, 95% CI 0.006 to 0.318; eight studies; significant heterogeneity). There was no statistically significant effect compared with print interventions (four studies).

Larger effect sizes were associated with shorter intervention periods of up to four months duration (0.226, 95% CI 0.089 to 0.363; 10 studies); and single-session interventions (0.404, 95% CI 0.130 to 0.677; four studies). There was statistically significant heterogeneity for both of these results. There was a non-statistically significant positive correlation between quality and effect size (r=0.116). Some evidence of publication bias was reported.

### Authors' conclusions

Although the effect was small, online interventions have the capacity to influence voluntary behaviours routinely targeted by social marketing campaigns, and have the advantages of low cost and broad reach.

### CRD commentary

The review addressed a very broad question, but this was supported by potentially replicable inclusion criteria. A number of relevant data sources were searched for published and unpublished studies but restriction to papers in English might mean that some studies were missed. A recognised quality assessment tool was used to assess the included studies, but the results of this were not fully reported or explained. There was potential for error and bias in the review process as it was not clear how many reviewers were involved in the stages of study selection or quality assessment and data extraction appeared to be conducted by one reviewer. It was questionable whether a statistical synthesis was appropriate, given the substantial heterogeneity featured in the studies.

The authors conclusions regarding cost and reach do not appear to be borne out of the evidence presented. This, plus potential methodological weaknesses in the review meant that the reliability of the conclusion was unclear.

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

**Practice:** The authors stated that there was potential benefit to combine interpersonal online interventions with mass-media outreach in future public health campaigns.

**Research:** The authors referred to a number of design issues that might suitably be explored in future research.

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