Computer- and web-based interventions to promote healthy eating among children and adolescents: a systematic review

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CRD summary
This review concluded that computer- and web-based interventions can improve eating behaviour and diet-related physical outcomes among children and adolescents but post-intervention strategies were needed to maintain results. The authors’ preliminary conclusions are fair but most of the outcomes in the review were based on self-report rather than objective measures.

Authors' objectives
To evaluate the effects of computer- and web-based interventions on improving eating behaviour and/or diet-related physical outcomes among children and adolescents. To assess whether specific aspects of these interventions were particularly effective.

Searching
CINAHL, PubMed, PsycINFO, ERIC, ProQuest and unspecified Cochrane databases were searched from 1998 to 2011 for relevant papers published in English. Search terms were presented. Supplementary searches included reference list checking.

Study selection
Both randomised and non-randomised controlled studies were eligible for the review. Studies were included if they involved a computer- or web-based healthy eating intervention with or without a physical activity intervention for children (six to 11 years old) or adolescents (12 to 18 years old). They needed to provide quantitative outcome data on an aspect of eating behaviour or a diet-related change in physical outcomes such as per cent body fat. Studies aimed at eating disorders were excluded.

All studies were designed to improve some type of eating behaviour and about half also aimed to improve nutrition knowledge, willingness to change or diet-related physical outcomes. Almost half were not based on a particular theory of behaviour. Most studies were conducted in USA. Around one third of the studies recruited only girls and the rest included both boys and girls. Most interventions were web-based and over half were conducted in a school setting. Study duration varied between one session and sessions spread over two years. Some interventions included face-to-face components. Control groups included no intervention, delayed intervention and traditional education. A small proportion of interventions had parental involvement. Most studies had only self-report measures and less than one third also included physical measures.

Two reviewers selected studies for the review.

Assessment of study quality
Two reviewers independently assessed the studies based on having a focused research question, method of selection of sample and allocation to intervention or control group, power calculation and method of analysis, baseline comparability of groups, consideration of confounding factors and whether exposure to intervention was measured accurately. Disagreements were discussed and resolved by consensus.

Data extraction
Two reviewers extracted data and compared results to ensure consistency.

Methods of synthesis
The authors conducted a narrative synthesis. They presented evidence by delivery method, setting, use of theoretical framework and tailored or personalised feedback.

Results of the review
Fifteen studies (at least 7,000 participants) were included in the review: eight randomised controlled trials (RCTs) and seven quasi-experimental studies. Individual study quality criteria were reported fully but there was no synthesis of quality in the results section.

Six out of the 10 web-based interventions and all five of the computer-based interventions resulted in significant improvements in eating behaviour and/or diet-related physical outcomes. Significant improvements were noted in eight of the 11 school- and agency-based interventions and in three of the four home- and camp-based interventions. Seven of the nine interventions that employed a theory or model noted improvements in eating behaviour. Two of the six studies that were not based on a theory also showed improvements in eating behaviour and three of the six without a theory base improved diet-related physical changes. Four of the six interventions that included individual tailoring or personalisation of intervention content along with a theory or model had significant improvements in eating behaviour.

Three studies included a follow-up measure to assess maintenance of intervention effects. None of the three indicated that eating behaviour or physical change was maintained.

Authors' conclusions
The authors’ preliminary conclusions were that computer- and web-based interventions can improve eating behaviour and diet-related physical outcomes among children and adolescents but post-intervention strategies were needed to maintain results.

CRD commentary
The review was based on broadly defined inclusion criteria. Searching encompassed a range of resources but was limited to publications in English, which opened up the possibility of language and publication biases. Two reviewers selected studies, extracted data and assessed study quality (which helps to minimise bias and error). A narrative synthesis was appropriate given the differences between studies in participants, interventions, outcomes and theories. Study quality was assessed and used to inform the inclusion of studies in the review.

The role of a range of intervention variables (such as use of a theoretical framework or use of tailored feedback) was examined in the synthesis. Conclusions on effectiveness were based on counting the numbers of studies with statistically significant results.

The authors' preliminary conclusions on the potential of computer- and web-based interventions are fair but effects tended not to be maintained after the intervention and that most of the outcomes in the review were based on self-report from an intervention that was not blinded.

Implications of the review for practice and research
Practice: The authors stated that computer- and web-based interventions can be used to supplement or strengthen nursing efforts in providing preventative care. Efforts to maintain effects of the intervention were needed.

Research: The authors stated that future research should examine the influence of social support from teachers and classmates in an educational setting and from family, friends and the media. Future research should integrate interventions in a school setting, incorporate individually tailored or personalised feedback, use physical measures wherever possible to obtain an objective assessment and incorporate post-intervention follow-up efforts to maintain change.

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Bibliographic details

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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.