Characteristics of effective internet-mediated interventions to change lifestyle in people aged 50 and older: a systematic review

Aalbers T, Baars MA, Rikkert MG

CRD summary
This review found that Internet-mediated interventions have potential for the implementation of effective lifestyle programmes in older adults. Some methodological limitations mean that the results should be interpreted with caution and the reliability of the authors’ conclusions is unclear.

Authors' objectives
To evaluate whether Internet-mediated lifestyle interventions could successfully change lifestyle in people aged 50 years and older.

Searching
PubMed was searched for relevant articles in English or Dutch between January 1995 and September 2010; search terms were reported. Exploratory literature searches were also conducted to ascertain appropriate keywords. The reference lists of retrieved articles were searched for additional studies.

Study selection
Eligible studies compared web-based interventions designed to achieve lifestyle change on behaviours related to healthy aging in community-dwelling adults (aged 50 years or over) to a control group. Adults who suffered from major physical or mental disabilities were not eligible for inclusion. Some form of process and outcome evaluation had to be used to provide feasibility and effectiveness data. Studies of virtual reality were excluded.

The interventions in the studies were weight loss, physical activity, nutrition and control of diabetes mellitus. Components of the interventions included: the use of social network forums; online article access; in-person goal setting; in-person motivational coaching; online messaging of health coaches; self-monitoring; health recipes; email advice; self-efficacy strategies; knowledge quizzes; learning protocols; prompting to use web sites; tailored advice; and newsletters. Most studies used complex interventions comprising several online components. The remaining studies used single component interventions. The patients were recruited using general practitioners and healthcare services, newspapers, mass mailings, flyers and posters. The average age of the adults was 54.9 years and 62.2% of the participants were females. The average length of follow-up was seven months (range 1.5 to 30 months).

Two reviewers independently performed the study selection; any discrepancies were resolved by consensus.

Assessment of study quality
The risk of bias assessment was conducted using the Cochrane Evidence Practice and Organisation of Care Group's form, in which methodological quality was evaluated in terms of the use of adequate sequence generation, allocation concealment, similar baseline outcome measures and characteristics, the treatment of incomplete data, blinding, protection against contamination, freedom from selective reporting, freedom from incentives and selection bias.

The authors did not state how many reviewers performed the quality assessment

Data extraction
Data were extracted using intention-to-treat analyses (when provided) and last follow-up possible to calculate effect sizes. Where more than two groups received an intervention, the control group was compared with the group that received the most intensive intervention.

Data were extracted by two independent reviewers

Methods of synthesis
The authors summarised the results of the review in a narrative synthesis because of heterogeneity in intervention type,
the area of focus and the outcome measures reported.

**Results of the review**

Ten studies (4,984 participants) were included in the review. There were seven randomised controlled trials and five pre- and post-test pilot studies. The attrition rate ranges from zero to 52%. Four studies reported adequate sequence generation, allocation concealment and adequate protection against contamination. Incomplete data was addressed in five studies. Blinding was described in seven studies, as was freedom from selective reporting and incentives. Similarity in baseline characteristics were reported in seven studies, selection bias was accounted for in four studies. No single study scored positive on all quality criteria.

Effect size calculation was possible in seven studies, in which six studies presented eight effect sizes indicating the intervention was effective. The mean effect size for online intervention groups compared with offline control groups was 0.19 (±0.21), and compared with online control groups was 0.39 (±0.37).

Single component interventions (both online and the online comparison groups) had mean effect sizes of 0.15 (±0.20) and the complex multi-component offline interventions had effect sizes of 0.19 (±0.21) compared with online interventions. The complex multi-component interventions had a mean effect size of 0.51 (±0.33) compared with online interventions.

Two studies provided information on dose-response relationships. Meeting a login goal over 10 weeks significantly increased weight loss compared with those who used logins for less than 10 weeks. In another study, the intervention group with more exposure to a web site increased physical activity significantly more than the control group.

No large differences between the different focus areas were found.

**Authors' conclusions**

Internet-mediated interventions have great potential for the implementation of effective lifestyle programmes which could reach large numbers of older adults for a very low cost.

**CRD commentary**

The review addressed a clearly defined question and criteria for the inclusion of studies were stipulated and reproducible. There was a limited search of only one appropriate database, which meant that relevant studies may have been missed. There were no attempts to identify unpublished studies, so the risk publication bias was possible. The restriction of the review to studies published in particular languages meant there was a risk of language bias. Steps were taken to minimise errors and bias for the performance of study selection and data extraction, but were not reported for the assessment of methodological quality.

Studies were generally of medium quality. The authors stated they were going to summarise the results in a narrative synthesis, but mean effect sizes were calculated and presented in the review. The combination of the results in this way, including results from uncontrolled studies, may not have been appropriate as the results from uncontrolled studies were associated with several potential biases. The authors' conclusions were based on the evidence presented, but the limited search, the medium quality of the studies and the small to moderate effect sizes meant that the results should be interpreted with some caution.

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

**Practice:** The authors stated that Internet-mediated interventions have potential for implementing effective lifestyle programmes capable of reaching large numbers of older people at low costs. Although social networking was used as a tool in the interventions, they were ineffective as participants rarely used these forums.

**Research:** The authors stated that the reporting of the process evaluation of Internet-based interventions needs to be standardised, with detailed accounts on the use and efficacy of different Internet components. More data was also required on possible dose-effect relationships by measuring the effect on intervention exposure on the effectiveness of the intervention.

**Funding**

Not stated.
Bibliographic details

PubMedID
21628005

DOI
10.1016/j.arr.2011.05.001

Original Paper URL

Indexing Status
Subject indexing assigned by NLM

MeSH
Age Factors; Aged; Aged, 80 and over; Clinical Trials as Topic /methods /trends; Cognition /physiology; Female; Health Behavior; Humans; Internet /trends /utilization; Life Style; Male; Middle Aged; Treatment Outcome; Weight Loss /physiology

AccessionNumber
12011005803

Date bibliographic record published
20/10/2011

Date abstract record published
21/05/2012

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.