
A systematic review of the effects of e-health on chronically ill patients

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CRD summary

This review evaluated e-health compared with (or in addition to) usual care for improving self-management in chronically ill patients. The authors concluded that limited evidence showed small to moderate effects for clinical health outcomes. Potential for error and bias in the review process means that some caution might be required when interpreting the reliability of this review.

Authors' objectives

To evaluate the effects of e-health compared with (or in addition to) usual care in improving self-care management in patients who were chronically ill.

Searching

PubMed, CINAHL, Cochrane Database of Systematic Reviews, DARE and Cochrane Central Register of Controlled Trials (CENTRAL) were searched for articles published between January 2000 and July 2009. Search terms were reported. The reference lists of relevant articles and systematic reviews were scanned for additional studies.

Study selection

Eligible for inclusion were randomised controlled trials (RCTs) of usual care compared with e-health used as an addition to, or in place of, usual care in patients with somatic chronic diseases. E-health was defined as the use of an interactive web site with store-and-forward messages to provide treatment and information/education between healthcare providers and patients (without them having to be present at the same time). Excluded were studies using only a monitoring device, telephone, webcam or video-conferencing. The outcome of interest was improved self-care management (including health, quality of life and patient satisfaction).

All included studies reported on a range of health outcomes. Other outcomes were sparsely recorded. E-health interventions included monitoring, coaching on self-management, treatment instructions and general information/web-based messaging. Usual care comprised regular hospital or home visits and visits to the general practitioner. Children and adult participants with a range of chronic conditions were included.

Two reviewers selected studies for inclusion.

Assessment of study quality

Trial quality was assessed using Cochrane criteria, covering research design, statistical power, recruitment, drop-outs and validity/reliability of outcome measures. One point was awarded for meeting the criteria; 0.5 point was awarded where criteria were partially met. Total scores (out of eight) were calculated.

The authors did not state how many reviewers were involved in the quality assessment.

Data extraction

Data were extracted on the differences between means at pre- and post-measurement, divided by the standard deviation of means at pre-measurement. This data enabled the calculation of effect sizes (Cohen). Effect sizes above 0.8 were considered large, between 0.8 and 0.5 were medium and between 0.5 and 0.2 were small.

The authors did not state how many reviewers extracted the data.

Methods of synthesis

A narrative synthesis was presented. Study differences were tabulated.

Results of the review

Twelve RCTs (11,175 participants) were included in the review. Total quality scores ranged from four to seven (randomisation, comparability of groups, loss to follow-up and use of validated outcome measures were present in most

trials). Drop-outs were high (22% and 25.5%) in two trials; intention-to-treat analysis was used in three trials.

E-health in addition to usual care versus usual care (seven trials): E-health interventions resulted in small to moderate improvements for physical health outcomes in patients with diabetes (four trials). No improvements in physical health were observed in two trials. Effects on resource use were mixed (three trials).

E-health versus usual care (five trials): E-health interventions in patients with diabetes showed small to moderately improved health outcomes in terms of glycosylated haemoglobin (four trials). Similarly-sized improvements in weight, body mass index and major cardio-vascular-related events after six months were reported following e-health interventions in patients with cardiovascular disease (one trial). One trial reported that patients were satisfied with the intervention. Other outcomes were either not improved or no different between groups in the five trials.

Cost information

Four trials assessed cost-effectiveness. The results from one trial showed a net cost saving of \$965 in favour of e-health interventions.

Authors' conclusions

Limited evidence showed that small to moderate effects were possible for clinical health outcomes following e-health interventions used in conjunction with, or instead of, usual care.

CRD commentary

The review question was clear and inclusion criteria were detailed enough to allow replication. Several data sources were accessed, but the restriction to published studies meant relevant studies may have been missed. The selection of studies was carried out with efforts to minimise error and bias, but the extent to which this was done for data extraction and quality assessment was unclear.

Study details were presented and substantial variation indicated that the choice of narrative synthesis was appropriate. Study quality appeared reasonable, but the evidence base presented was limited (acknowledged by the authors). The potential for error and bias in parts of the review process meant that a degree of caution might be required when interpreting the reliability of this review.

Implications of the review for practice and research

Practice: The authors stated that e-health showed promise for the treatment and self-management of patients with chronic illness.

Research: The authors stated that further research was needed to verify the positive outcomes of e-health in larger samples and evaluate cost-effectiveness. Particular attention should be paid to dropout or low-usage attrition.

Funding

University Medical Centre of Utrecht, The Netherlands.

Bibliographic details

Eland-de Kok P, van Os-Medendorp H, Vergouwe-Meijer A, Bruijnzeel-Koomen C, Ros W. A systematic review of the effects of e-health on chronically ill patients. *Journal of Clinical Nursing* 2011; 20(21/22): 2997-3010

PubMedID

21707807

DOI

10.1111/j.1365-2702.2011.03743.x

Original Paper URL

<http://onlinelibrary.wiley.com/doi/10.1111/j.1365-2702.2011.03743.x/abstract>

Indexing Status

Subject indexing assigned by NLM

MeSH

Chronic Disease; Humans; Internet

AccessionNumber

12011006834

Date bibliographic record published

28/02/2012

Date abstract record published

18/05/2012

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.