Home-based telehealth: a review and meta-analysis
DelliFraine J L, Dansky K H

CRD summary
This review aimed to determine the effect of home telehealth on clinical care outcomes. It concluded that telehealth was an effective clinical intervention in many settings with different patient groups. Given various methodological limitations of the review, this conclusion cannot be considered entirely reliable.

Authors' objectives
To determine the effect of home telehealth on clinical care outcomes.

Searching
ProQuest, MEDLINE, ABI, CINAHL and Dissertation Abstracts International databases were searched for relevant English-language studies from 2001 to 2007. Additional studies were identified by checking reference lists of retrieved articles.

Study selection
Controlled studies reporting clinical outcomes of telehealth in home or residential settings were eligible for inclusion in the review. To be included in the meta-analysis studies were required to report sufficient statistical information to allow the calculation of effect sizes.

Studies selected for the review covered a broad range of patient diagnoses (mostly diabetes, heart disease and psychiatric conditions) and telehealth technologies (including web-based interventions, video and data monitors alone or in combination, and telephone interventions).

Two reviewers assessed articles for inclusion.

Assessment of study quality
The authors did not state that they assessed validity of individual studies.

Data extraction
Study characteristics were coded for each article, with sample size, means, proportions and standard deviations used to calculate effect sizes. For studies reporting multiple outcomes, individual effect sizes were averaged to create a single effect size for each study. Where outcomes were reported at different follow-up times, only the measurement nearest six months was extracted. For each outcome reported, the authors calculated Cohen's standardised mean difference effect size statistic with Hedges' sample size correction. A positive effect size indicated that telehealth outcomes were better with telehealth; a negative effect size indicated better outcomes with control.

One reviewer coded all data and a second reviewer checked a sub-sample of studies to ensure reliability.

Methods of synthesis
Weighted pooled effect sizes and related 95% confidence intervals were calculated, using a random-effects model where there was evidence of statistical heterogeneity (as determined by the Q statistic). Subgroup meta-analyses of studies by study design, age group, gender, race, diagnosis and intervention were also undertaken.

Results of the review
Twenty-nine studies were included in the review (1,993 participants), of which 24 were randomised (1,706 participants).

The overall effect size for all studies was 0.50 (95% CI 0.18 to 0.82). The effect size was largely unchanged for the subgroup of randomised studies.

Pooled effect sizes were significant for studies of data monitor (effect size 0.26, 95% CI: 0.07 to 0.44; 12 studies) and...
video monitor interventions (effect size 0.78, 95% CI 0.21 to 1.35; eight studies), but not for Internet interventions (effect size 0.20, 95% CI -0.06 to 0.46; seven studies).

Pooled effect sizes were significant for studies in heart disease (effect size 0.32, 95% CI 0.11 to 0.52; six studies) and psychiatric conditions (effect size 1.42, 95% CI 0.29 to 2.55; five studies), but not for diabetes (effect size 0.13, 95% CI -0.07 to 0.33; six studies).

**Authors' conclusions**
The meta-analysis indicated that telehealth was an effective clinical intervention in many settings with different patient groups.

**CRD commentary**
The review question was broadly defined in terms of the interventions, outcomes and study designs of interest. Several different sources were used to identify relevant evidence, but the search was limited to English-language published studies and dissertations, so the potential for publication and language biases cannot be ruled out. It was not clear why the search was limited only to studies published from 2001. Attempts were made to minimise the potential for errors and bias in the selection of studies and extraction of data. The meta-analysis was undertaken according to established methods. However, beyond providing a subgroup analysis of randomised trials, the potential impact of study quality on the findings of the review was not considered. Also, insufficient information was presented on the included studies to allow the reader to distinguish important characteristics of these studies. Since the review statistically combined a group of clinically and methodologically heterogeneous studies, the conclusion is necessarily broad. Given the limitations described above, this conclusion cannot be considered entirely reliable.

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

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

**Research**: The authors stated that further research on the cost-effectiveness of telehealth is required. They also stated that research on the similarity of telehealth to usual care is needed, preferably with standardised interventions and outcomes.

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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.