Elements of nonpharmacologic interventions that prevent progression of heart failure: a meta-analysis
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CRD summary
This meta-analysis concluded that non-pharmacological interventions for heart failure, such as nurse-led education and management programs, reduced hospitalisations and all-cause mortality. Interventions delivered face-to-face were particularly effective. The review and meta-analysis methods were mostly appropriate, but possible language bias and a lack of reporting of the validity assessment, limit the reliability of these findings.

Authors' objectives
To review whether non-pharmacological interventions are associated with reductions in hospitalisations and mortality in patients with heart failure, and to assess the effects of face-to-face contact and longer treatment duration.

Searching
MEDLINE and PsycINFO were searched to June 2006. Search terms were reported. Bibliographies of articles were also searched. Only English language articles were included.

Study selection
Randomised controlled trials (RCTs) of any non-pharmacological treatment (such as heart failure education, case management and discharge planning, disease management such as self-management or behavioural treatments, and exercise interventions) for heart failure patients, were eligible for inclusion. Included trials had to report heart failure hospitalisation or all-cause mortality as an outcome. Pilot studies, studies of drug treatment and studies of interventions delivered by non-professionals were excluded.

Included trials mostly assessed nurse-led or multidisciplinary heart failure management and education programmes, delivered either face-to-face, by telephone, or a combination of the two, compared with usual care. Mean patient ages ranged from 56 to 79 years. The duration of the included interventions ranged from less than one month to 14 months.

The authors did not state how studies were selected for the review, or how many reviewers performed the selection.

Assessment of study quality
Study validity was assessed using the Jadad scale, which was modified regarding double-blinding to give one point for the blinding of outcome assessors and an additional point for reporting that the staff were blind to the study hypothesis.

The validity assessment was performed by two reviewers independently with disagreements resolved by consensus.

Data extraction
The numbers of events in each treatment group were used to calculate the odds ratio (OR) and 95% confidence intervals (CI) for all-cause mortality and heart failure hospitalisation.

Data were extracted by two reviewers independently in an unblinded standardised manner.

Methods of synthesis
Odds ratios were pooled using a DerSimonian and Laird random-effects model. Statistical heterogeneity was assessed with the Cochran's Q test. Meta-regression was used to compare outcomes between the different types of intervention delivery (each compared with control for face-to-face, combined and telephone delivery), and between duration of intervention (less than 12 months, or 12 months or more, compared with control). For these analyses multivariate linear mixed-effect regression models were used.
Results of the review
Twenty six RCTs were included in the review (n=4,671 patients, ranging from 34 to 462). Ten trials assessed face-to-face contact. Nine trials were combined (face-to-face and non face-to-face). Seven trials assessed non face-to-face contact.

Non-pharmacological treatment led to a statistically significant reduction in heart failure hospitalisation (summary OR 0.41, 95% CI: 0.30 to 0.56, based on 21 RCTs) and also all-cause mortality (summary OR 0.69, 95% CI: 0.56 to 0.85, based on 22 RCTs). There was evidence of statistical heterogeneity for heart failure hospitalisation (p<0.001) but not for mortality (p=0.19).

Patients receiving face-to-face treatment were significantly less likely to be hospitalised (OR 0.42, 95% CI: 0.22 to 0.81) or die (OR 0.63, 95% CI: 0.44 to 0.91) compared with control. Patients receiving combined treatment were also less likely to be hospitalised (OR 0.37, 95% CI: 0.21 to 0.64) compared with controls, but there was no evidence of a difference for telephone interventions. For duration of treatment, longer treatment (12 months or more) led to significant reductions in both hospitalisations (OR 0.35, 95% CI: 0.17 to 0.71) and mortality (OR 0.64, 95% CI: 0.42 to 0.96) compared with controls. Similar results were seen for interventions of less than 12 months duration (OR 0.42, 95% CI: 0.27 to 0.65) and for mortality (OR 0.72, 95% CI: 0.53 to 0.96).

Authors' conclusions
Non-pharmacological treatments for the management of heart failure were associated with reduced rates of heart failure hospitalisation and all-cause mortality. Face-to-face interventions were effective but there was no evidence to support the use of non face-to-face interventions.

CRD commentary
This review had clear inclusion and exclusion criteria with respect to study design, participants, interventions and outcomes. The search was adequate, but including only English-language studies may have led to language and publication bias. Data extraction and validity assessment were performed by two reviewers independently, which reduced the risk of errors and bias. The authors stated that they assessed study validity but did not report these results, or make any attempt to link the findings of the review to the quality of the evidence. The statistical analysis methods were appropriate, but given the high level of heterogeneity for the heart failure hospitalisation outcome, the pooled value should be treated with caution. However, the authors did explore the heterogeneity by using regression analyses to compare subgroups; they found that the mode of delivery of the intervention accounted for some of the observed heterogeneity. Only brief details of each trial were provided; further details, such as the duration of heart failure, gender and other treatments, might have been useful. The review and meta-analysis methods were mostly appropriate, but possible language bias and a lack of reporting of the validity assessment, limit the reliability of these findings.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice.

Research: The authors recommend that heart failure hospitalisation and mortality should be included as outcomes in future studies of exercise interventions, and that data on the frequency of contacts are reported.

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