A systematic review and meta-analysis of studies comparing readmission rates and mortality rates in patients with heart failure

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CRD summary
The review investigated readmission and mortality rates of patients with heart failure who had received a patient education intervention delivered by a multidisciplinary team. The authors concluded that the intervention reduced readmission in comparison with standard care, but that there was no difference in mortality. The authors’ conclusions are a reliable summary of the available evidence at the time of the searches (2000).

Authors’ objectives
To evaluate the effectiveness of multidisciplinary heart failure management programmes on hospital readmission rates and mortality.

Searching
MEDLINE (1966 to 2000), HealthSTAR (1975 to 2000), EMBASE, PubMed and the Cochrane Library were searched; the search terms were only reported for some of the databases. In addition, relevant journals and meeting abstracts were checked, the authors’ own files were searched, and experts were contacted for additional studies. The reference lists of all included studies were screened.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs) were eligible for inclusion. The follow-up period ranged from 3 to 12 months.

Specific interventions included in the review
Studies evaluating a patient education intervention directed at increasing the patients’ knowledge of their heart failure diagnosis, signs, symptoms, and/or treatment, and delivered by a multidisciplinary team, were eligible for inclusion. The studies had to compare the intervention group with a group receiving usual care delivered by a family physician, internist, or cardiologist. The included studies assessed educational visits by various health professionals before discharge, videos, booklets plus home visits, telephone assessments, mailed information and out-patient visits after discharge.

Participants included in the review
Studies of adult patients (aged over 18 years) who were hospitalised for heart failure, and who were enrolled in the study either during their hospitalisation or immediately before or after discharge, were eligible for inclusion.

Outcomes assessed in the review
The studies needed to report unplanned readmissions for heart failure for all causes in a follow-up period of at least 3 months to be eligible for inclusion. The secondary outcomes specified were mortality, compliance and quality of life. The included studies used different disease-specific instruments to measure quality of life.

How were decisions on the relevance of primary studies made?
Two reviewers screened the title and abstracts of identified studies. Four reviewers independently assessed the full paper copies of potentially relevant studies, and any disagreements were resolved through discussion.

Assessment of study quality
The authors modified the Jadad scale and assessed the following: description of the method of randomisation, blinding of the patients and physicians, appropriateness of the blinding method, and the description of withdrawals and drop-
outs. Studies scoring four out of the maximum of five points were considered to be high quality. Four reviewers independently assessed validity.

**Data extraction**
The authors did not state how the data were extracted for the review, or how many reviewers performed the data extraction.

The relative risks of readmission and mortality in patients in the intervention group, compared with those in the control group, were computed.

**Methods of synthesis**
How were the studies combined?
Pooled risk ratios (RRs) and 95% confidence intervals (CIs) were computed using a random-effects model. Two reviewers ran the analyses independently as a quality measure. The possibility of publication bias was explored using a funnel plot.

How were differences between studies investigated?
Statistical heterogeneity was assessed using the Cochran Q statistic. There were insufficient data to assess the influence of duration of follow-up on quality-of-life outcomes.

**Results of the review**
Eight RCTs (n=1,239) were included in the review.

All of the studies were high quality (quality score 4 or more out of 5).

The relative risk for hospital readmission was 0.79 (95% CI: 0.68, 0.91, P<0.001) in favour of the group receiving a patient education intervention delivered by a multidisciplinary team, based on all 8 studies (non significant heterogeneity between study results, P=0.25).

The intervention showed no statistically significant effect on mortality (RR 0.98, 95% CI: 0.72, 1.34, P=0.9), based on 6 studies (non significant heterogeneity, P=0.20).

Two of the three studies assessing quality of life showed a significant improvement in health-related quality of life with the intervention; the other study showed no difference between the treatment and control groups.

The funnel plot showed no indication of publication bias.

**Authors’ conclusions**
Specific heart failure-targeted interventions significantly decreased hospital readmissions, but not mortality rates.

**CRD commentary**
The review was based on a clear review question and inclusion criteria. The searches were thorough and the possibility of publication bias was assessed. Attempts were made to identify unpublished studies and data from ongoing trials were obtained from principal investigators. Measures were taken to reduce bias and errors in the selection of studies, assessment of validity and analysis of the data; the agreement between reviewers was also documented. The quality of the included studies was assessed using established criteria. The results of the individual studies were presented in detail and ensured transparency of the conclusions drawn from the evidence. The data of the included studies captured only a limited follow-up period (3 to 12 months). The data were analysed separately according to whether patients were readmitted or not and whether they died or not, but presumably not in combination (a requirement for readmission is to be alive).
It is doubtful whether the review captured all currently available data on the topic since the review was published 4 years after the searches were completed. The conclusions are reliable as a summary of the available evidence at the time of the searches (year 2000).

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

Practice: The authors stated that the findings support the implementation of a discharge programme aimed at improving medical compliance and lifestyle adjustments.

Research: The authors stated that future studies should be larger and have longer follow-up periods (i.e. 3 to 5 years).

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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.