Nurse-led telephone interventions for people with cardiac disease: a review of the research literature

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CRD summary
The review concluded that nurse-led telephone interventions to deliver education and support for people with cardiac disease showed some benefits, but more rigorous research was required. Studies with positive effects were generally larger and had stronger designs, more intensive interventions and better outcome measurement. Potential limitations in the review process mean that the authors’ conclusions should be treated with caution.

Authors' objectives
To evaluate the efficacy of nurse-led telephone interventions in delivering education and support for people with cardiac disease.

Searching
Science Direct, CINAHL, MEDLINE and ProQuest were searched from 1980 to 2009 for publications in English; search terms were reported.

Study selection
Hypothesis testing studies that evaluated nurse-delivered telephone interventions for people with cardiac disease during the post discharge period were eligible for inclusion. Relevant interventions had to be nurse initiated and deliver education and support. Studies were excluded if the interventions did not monitor cardiac recovery. The authors used a broad definition of cardiac disease that included patients diagnosed on hospital admission with acute coronary syndrome, unstable angina, myocardial infarction, heart failure, implantable defibrillation devices and percutaneous coronary interventions (PCI) and admissions for cardiac surgery that included coronary artery bypass surgery (CABG) and cardiac valve repair or replacement surgery. All outcomes were included.

Most studies were performed in USA or Canada; other studies were in Europe or Australia and one was in Argentina. Interventions ranged from one telephone call to weekly or monthly calls for 12 months. Less than one third of studies reported that they used specially trained or experienced nurses. Relatively few studies included additional support such as cardiac rehabilitation programmes and clinic visits. The most common aims were to reduce symptoms, anxiety, depression and stress, improve self-management skills and quality of life (QoL) and reduce smoking, blood pressure and lipid levels and thus reduce mortality. A few studies aimed to reduce resource use, readmission rates and assess their services. Outcomes assessed were related to the aims and also included knowledge tests, risk scores, hospital costs, patient satisfaction and wound problems. Cardiac patients in the studies varied widely; almost one in three studies was of heart failure patients.

The authors did not report how many reviewers performed study selection.

Assessment of study quality
The authors extracted data relevant to methodological quality. These were summarised in tables, text and discussion. Data were on study design, randomisation, sampling, power calculation, intervention suitability, nurse experience level, outcome measurement validity and reliability, missing data, level of attendance, loss to follow-up and multi-site or single-site study.

The authors did not report how many reviewers performed the validity assessment.

Data extraction
Most relevant data was extracted in tabular form. Details were extracted for outcomes measured and included whether results were significant. No numerical data were extracted. Comments on efficacy of interventions were made and
included comments on whether they were cost effective.

The authors did not report how many reviewers performed data extraction.

**Methods of synthesis**
A narrative synthesis was performed, presumably due to heterogeneity of both interventions and measured outcomes. The authors separated studies with positive effects for all outcomes, studies with mixed results (positive or not significant) and studies with no significant outcomes. Outcomes were separated into six groups: risk factors and knowledge; functional status; psychological status; self management and self efficacy; complications and hospital consumption; and satisfaction with the telephone interventions.

**Results of the review**
Twenty-four studies were identified (8,330 participants): 19 RCTs (4,228 participants, range 23 to 1,518); two quasi-experimental studies with nonrandomised equivalent control groups with pre- and post-test comparison (102 participants and 342 participants); one non-randomised study with post-test comparison (40 participants); one retrospective cohort study that compared unequal sized groups (3,536 participants); and one post-test study with no control group (82 participants).

Fourteen RCTs used convenience sampling. Five RCTs compared two groups post test only. There were seven large studies (240 to 3,536 participants), seven medium-sized studies (100 to 200 participants) and 10 small studies (fewer than 100 participants). There were 17 single-site studies and seven multisite studies. Six of 12 studies that performed a power analysis reported sufficient sample sizes. Eight studies did not report the validity or reliability of the instruments used for measurement of outcomes.

Significant positive results were reported in all outcome measures for seven studies (five RCTs, one quasi-experimental study and one retrospective cohort study). Outcome measures included risk factor behaviours (four studies), hospital readmission and mortality (one RCT), cardiac rehabilitation programme attendance (one non-RCT) and QoL (one RCT). The authors reported that these studies had strong research designs and valid and reliable instruments. The smaller studies were thought to have extensive educative telephone interventions.

Results in the other studies were more equivocal. Eight studies (seven RCTs and one quasi-experimental study) demonstrated significant results for at least one reported outcome. These outcomes included psychological status (four RCTs), risk factors (two studies), self efficacy (two RCTs), resource use (two RCTs) and QoL (one RCT). Nine studies (seven RCTs and two non-randomised studies) reported no statistically significant differences. The authors considered that most of these nine studies had design faults and smaller sample sizes. No studies reported negative findings.

**Cost information**
The interventions in five of the 24 studies were considered by the authors to be cost effective.

**Authors' conclusions**
The results suggested that people with cardiac disease showed some benefits from nurse-led delivered telephone interventions. Studies with positive effects generally had stronger research designs, large samples, used valid and reliable instruments and included extensive nurse-led educative interventions. More rigorous research was needed in this area.

**CRD commentary**
The review addressed a well-defined question in terms of participants, interventions and study design. Relevant outcomes were not defined. Relevant databases were searched. Only published studies in English were sought so some relevant studies may have been missed. Publication bias was not assessed. Study quality was assessed using suitable criteria and relevant information was reported. No efforts to reduce error and bias during the review process were reported. Some relevant study details were reported, but length of follow-up and loss to follow-up and patient age and gender were not reported for all studies. No information was provided for control groups.
A narrative synthesis was provided. This was not appropriate because of the number of RCTs identified. A meta-analysis should have been performed for the RCTs and more intensive interventions compared to less intensive interventions. No numerical data was reported. Although conclusions were made about the intensity of interventions, no direct comparison was made between intensive and simpler interventions and it was not possible for the reader to make a relevant assessment with the reported evidence. The authors’ conclusion at the end of the paper that there was not sufficient evidence appeared to contradict the conclusion in the abstract that there were some benefits.

Potential limitations in the review process mean that the authors’ conclusions should be treated with caution.

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

**Practice:** The authors recommended extensive educative interventions delivered by expert cardiovascular clinical nurses or advance practitioner nurses. These should provide telephone interventions or more than six telephone calls for at least three months of follow-up.

**Research:** The authors identified a need for well-designed multisite double-blind RCTs with sufficient sample size and power, valid reliable instruments with sufficient sensitivity and objective measures or biochemical measurements and pre and post testing. They recommended interventions with more telephone calls delivered by experienced nurses.

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