Comprehensive discharge planning and home follow-up of hospitalized elders: a randomized clinical trial


Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
A comprehensive discharge planning and follow-up protocol, implemented by advanced practice nurses (APNs), and tailored to the individual needs of elderly people hospitalized with one of several common medical or surgical reasons for admission.

Type of intervention
Secondary prevention.

Economic study type
Cost-effectiveness analysis.

Study population
Elderly people at risk for poor outcomes after discharge, with one of the following: congestive heart failure, angina, myocardial infarction, respiratory tract infection, CABG, cardiac valve replacement, major small and large bowel procedure and orthopaedic procedures of the lower extremities.

Setting
Hospital. The economic study was carried out in Philadelphia, USA.

Dates to which data relate
The effectiveness and resource use data corresponded to those elderly people admitted to the hospitals between August 1992 and March 1996. The fiscal year was not explicitly specified.

Source of effectiveness data
Effectiveness data were derived from a single study.

Link between effectiveness and cost data
The costing was prospectively performed on the same patient sample as that used in the effectiveness analysis.

Study sample
Power calculations were used to determine the sample size: with the assumption of a readmission rate of 0.30 for the control group, 2-sided alpha=0.05, beta=0.2, the study required that a cohort of 125 patients in each study group complete the study in order to be able to detect a 50% reduction in hospital readmission rates due to the introduction of the intervention programme. The study sample consisted of 363 patients randomly allocated to either the intervention group (n=177) with an average (SD) age of 75.5 (6.3) years or to the standard care group (n=186) with an average (SD)
age of 75.3 (6.0) years. The enrolment rate was 28% (out of n=1296 patients screened). The refusal to participate rate was 43%.

Study design
This was a randomized controlled trial, carried out in two centres. The duration of follow-up was 24 weeks after index hospital discharge. The attrition rate for the whole study was 28%. The intervention group had an attrition rate (including deaths) of 30% (53/177) versus 26% (48/186) in the control group, (p=0.26). The withdrawal rate because of "changed minds about participation" was 13% in the control group versus 18% in the intervention group, (p=0.28). The patients who completed the study were comparable to the attrition group in terms of sociodemographic factors and severity of illness measures. Research assistants (RAs) blinded to study groups and hypotheses collected the outcome data.

Analysis of effectiveness
The analysis of effectiveness was based on intention to treat. The primary health outcome adopted in the study was time to first readmission for any reason. Some of the other outcomes (secondary outcomes) assessed in the study were the readmission rate (at least once), multiple readmissions, hospital days per patient, post-discharge acute care visits, functional status (measured by the Enforced Social Dependancy Scale), depression (measured by the Center for Epidemiologic Studies Depression Scale), and patient satisfaction (measured by an investigator-developed instrument). The study groups were comparable in terms of sociodemographic and baseline health features. The proportional hazards regression was used to adjust for the effects of potentially confounding factors including variables such as number of prior hospitalisations within the past 6 months, and living with relative or friends rather than with spouse.

Effectiveness results
The intervention group had a significantly longer time to first readmission for any reason (log-rank chi-square=1.1, p<0.001); and this premise remained true even after adjusting for simultaneously significant confounding variables. When the control group was compared with the intervention group, the crude rate of relative readmission was 1.96 (95% CI: 1.31 - 2.92). When adjusted, the rate was 2.03 (95% CI: 1.34 - 3.08). The readmission rate (at least once) was 37.1% in the control group versus 20.3% in the intervention group, (p<0.001). The multiple readmission rate was 14.5% versus 6.2%, (p=0.01), respectively. The hospital days per patient were 4.09 days (control) versus 1.53 (intervention), (p<0.001). The study showed no significant differences between the groups in terms of post-discharge acute care visits, functional status, depression, and patient satisfaction.

Clinical conclusions
The authors believe that the focus of the clinical intervention on the combined effects of primary health problems, comorbid conditions, and other health and social issues common in this patient population, rather than on the management of a single disease, was a major factor in its success.

Measure of benefits used in the economic analysis
No summary benefit measure was identified in the economic analysis, and only separate clinical outcomes were reported.

Direct costs
Costs were not required to be discounted due to the short follow-up period of the study. Quantities of resources used were reported separately from the costs. Cost items were reported separately. The cost analysis covered the costs of acute care visits, home visits, therapists, social workers, and home health aides. The perspective adopted in the cost analysis was that of Medicare. Charges and actual Medicare reimbursements were used as proxies for true costs. Detailed logs were used to assess APN intervention-related effort after discharge, which was multiplied in Medicare reimbursement rates (the same rate as that applied for visiting nurses (VN)) to calculate the costs associated with the APN services after discharge. The date of the price data was not explicitly specified. It was reported that the cost...
analysis did not cover the costs of pharmaceuticals, over-the-counter drugs, assistive devices, and other supplies.

**Statistical analysis of costs**
Student’s t tests or Wilcoxon rank sum tests were used to compare the study groups in terms of reimbursements for post-discharge health services.

**Indirect Costs**
Not considered.

**Currency**
US dollars ($).

**Sensitivity analysis**
One-way simple sensitivity analyses were performed on the reimbursement rate and weighted APN average salary.

**Estimated benefits used in the economic analysis**
Not applicable.

**Cost results**
The average total cost per patient was $6,661 in the control group versus $3,630 in the intervention group, (p<0.001).

**Synthesis of costs and benefits**
Costs and benefits were not combined since the intervention was the dominant strategy. The sensitivity analysis intensified the difference in costs between the groups.

**Authors’ conclusions**
An advanced practice-nurse centred discharge planning and home care intervention for at-risk hospitalized elderly people reduced rehospitalizations, lengthened the time between discharge and rehospitalization, and decreased the costs of providing health care. Thus, the intervention demonstrated great potential in promoting positive outcomes for hospitalized elderly people at high risk for rehospitalisation while reducing costs.

**CRD COMMENTARY - Selection of comparators**
The reason for the choice of the comparator is clear.

**Validity of estimate of measure of benefit**
The estimates of effectiveness are likely to be internally valid given the randomized design adopted in the study, the sample size, intention-to-treat analysis of effectiveness, and adjustments made for the potentially confounding factors. Given the lack of a summary benefit measure, the study may be regarded as a cost-consequences analysis.

**Validity of estimate of costs**
Quantities of resources were reported separately from the costs. Adequate details of methods of cost estimation were given. Reimbursement rates were used as a proxy for true costs. The inclusion of the indirect costs incurred by the caregivers in the cost analysis would have been appropriate in the context in question if a societal point of view had been adopted. The fiscal year adopted in the study was not reported.
Other issues
The issue of generalisability to other settings or countries was not addressed. The issues of uncertainty could have been addressed in more detail by means of sensitivity analysis.

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