



HOSPITAL TO HOME OUTREACH FOR MALNOURISHED ELDERLY (HHOME): A FEASIBILITY PILOT

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Abstract: *Objectives:* Malnutrition is common in older hospitalised patients, and barriers to adequate intake in hospital limit the effectiveness of hospital-based nutrition interventions. This pilot study was undertaken to determine whether nutrition-focussed care at discharge and in the early post-hospital period is feasible and acceptable to patients and carers, and improves nutritional status. *Design:* Prospective cohort study. *Setting:* Internal medicine wards of a tertiary teaching hospital in Brisbane, Australia. *Participants:* Patients aged 65 and older admitted for at least 3 days, identified as malnourished or at risk of malnutrition using Mini Nutritional Assessment (MNA). *Interventions:* An interdisciplinary discharge team (specialist discharge planning nurse and accredited practicing dietitian) provided nutrition-focussed education, advice, service coordination and follow-up (home visits and telephone) for 6 weeks following hospitalisation. *Measurements:* Nutritional intake, weight, functional status and MNA were recorded 6 and 12 weeks after discharge. Service intensity and changes to care were noted, and hospital readmissions recorded. Service feedback from patients and carers was sought using a brief questionnaire. *Results:* 12 participants were enrolled during the 6 week pilot (mean age 82 years, 50% male). All received 1-2 home visits, and 3-8 telephone calls. Four participants had new community services arranged, 4 were commenced on oral nutritional supplements, and 7 were referred to community dietetics services for follow-up. Two participants had a decline in MNA score of more than 10% at 12 week follow-up, while the remainder improved by at least 10%. Individualised care including community service coordination was valued by participants. *Conclusion:* The proposed model of care for older adults was feasible, acceptable to patients and carers, and associated with improved nutritional status at 12 weeks for most participants. The pilot data will be useful for design of intervention trials.

Key words: Malnutrition, discharge planning, interdisciplinary care.

Introduction

Malnutrition is common in older patients hospitalised for medical illness, and associated with poor outcomes including longer hospital stays, increased mortality and increased readmissions (1). Considerable resources are devoted to identification and management of malnutrition in hospital. However, barriers to improving nutritional intake in hospital, and shorter hospital stays, mean that opportunities to make a meaningful difference to malnutrition in the course of the acute illness may be limited (2, 3). Nutritional deficits associated with acute illness and hospitalisation may take months to recover (4). An alternative approach is to view hospitalisation as an opportunity to identify a vulnerable patient group and institute longer term management of malnutrition (5). However, in Australia, dietetic resources in the

community are limited and service coordination between hospitals and the community is often poor due to differing funding structures and service priorities.

Two recent studies have examined the benefits of an individual post-hospital nutrition care plan for malnourished older patients (6, 7). Care planning was undertaken by a dietitian and focussed on enriched diets and/or liquid nutritional supplements, supported by home visits and/or telephone follow-up. These studies reported promising improvements in mortality (6) and functional status (7) but highlighted the complex social and logistical challenges faced by recently-discharged and chronically ill older patients. Discharge planning and early post-hospital outreach support are of benefit in older medical patients (8), and have been widely adopted. Discharge planning nurses have expertise in needs assessment and service coordination which may have a valuable role in addressing some barriers to adequate nutrition(4), but nutrition-related needs are not routinely and explicitly targeted in discharge planning processes (9).

We propose that combining the skills and expertise of discharge planning nurses and dietitians in an

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interdisciplinary discharge planning and outreach model could improve nutritional intake and nutritional status in older patients in the early post-hospital period, and thereby improve clinical outcomes such as functional status, mortality and hospital readmissions. This small pilot study was designed to test the feasibility, acceptability and effect of this new model on nutritional status in order to inform design of a future trial of efficacy and cost-effectiveness.

Methods

The pilot study was conducted in the internal medicine department of a large metropolitan teaching hospital in Brisbane, Australia. This department has a well established system of interdisciplinary inpatient care and early discharge planning (10). Specifically, each of the four medical units includes one half-time accredited practising dietitian who undertakes nutritional assessment and inpatient care of patients at risk of malnutrition identified on routine nursing admission screening or clinical assessment, and a nursing case manager who coordinates discharge care. Each team also has access to a specialist discharge facilitation nurse to assist complex discharges.

Participants were enrolled over a 6 week period November 2010-January 2011. Patients were eligible for the study if they were aged 65 years or older; admitted for 3 days or more; were discharged home to live in the community; lived in northern Brisbane; and were able to consent to participate. Patients were excluded if they were assessed as well nourished (score 12 or above) on the Mini Nutritional Assessment short form (MNA-SF, the screening component of MNA) (11), were being cared for with palliative intent, or had tube feeding or parenteral nutrition. The study was approved by the hospital Human Research Ethics Committee and written informed consent was obtained from all participants.

The intervention team consisted of an accredited practicing dietitian and an experienced discharge facilitation nurse (each working 20 hours per week on the project), who worked in close liaison with the four inpatient interdisciplinary teams. All participants received a full nutritional assessment to identify their nutritional status and requirements, and the intervention dietitian formulated an individualised post-hospital nutrition care plan, which was discussed with the participant and relevant family and/or carers. Specific verbal and written advice were provided to improve nutritional intake (e.g. sample meal plans), supported by brochures providing information on supermarket locations, budgeting suggestions, lists of nutrient-dense snacks and easy to prepare recipes. The intervention staff identified potential barriers to adequate nutrition following discharge and worked with the inpatient team to address these barriers (eg arranging shopping

support).

The intervention nurse visited participants at home within one week of discharge. This visit reinforced in-hospital education regarding adequate nutrition, addressed misperceptions (eg unnecessary food restrictions), allowed assessment of food storage and preparation facilities, and ensured that planned services were in place, acceptable and sufficient. Primary care services (general practitioner, domiciliary nursing, other community services) were contacted as required. Further advice and service coordination were provided by fortnightly telephone support over the following 6 weeks. The intervention dietitian telephoned or visited participants at 4 weeks to reassess their nutritional intake and requirements, and modified their nutrition care plan as appropriate. Telephone contact details for the intervention team were provided to participants to allow ready access to advice and support throughout the intervention.

Baseline data collected at enrolment included age, sex, primary diagnosis and comorbidities (from the medical record), nutritional assessment using MNA (12) (where a score of <17 indicates malnutrition, 17-23.5 indicates malnutrition risk and ≥ 24 indicates well nourished), self-reported functional status, and existing community services (13). Weight was measured using a single set of calibrated scales (Tanita HD351, accurate to 0.1kg) and height using a stadiometer (SECA 213, accurate to 1cm). Details of family carers, general practitioner and other primary care services were recorded, and a home visiting safety check completed.

Participants were reassessed by a research dietitian 6 and 12 weeks after discharge. Assessments included nutritional intake by multiple pass 24 hour recall (14), weight using the same scales and nutritional status using MNA. Food intake was converted to energy and protein intake using AUSNUT 2007 food composition database in Foodworks software (version 3.02, Xyris, Brisbane Australia 2004). Weight changes at 6 and 12 weeks were described as percentage of inpatient (baseline) weight change, with 5% weight loss regarded as clinically significant. Changes in MNA were described as percentage of baseline MNA change, with 10% change considered clinically significant. A brief questionnaire was administered at 12 weeks which included 7 statements about the perceived helpfulness of various intervention components (brochures, meal plans, community service coordination, etc) and 3 questions about current cooking, shopping and eating compared to pre-illness. Participants were asked to rate these statements using a 4 point Likert scale, which were then dichotomised for analysis (strongly agree/ agree vs not sure/ disagree). They could also offer comments or suggestions regarding the service.





Results

Over the enrolment period, 94 medical patients aged 65 years or older were discharged to the local community after a hospital stay of at least 3 days. Of these, 34 had cognitive or language impairment or terminal illness, 3 had tube feeding, 10 were discharged before review and 17 were assessed as well nourished on the MNA-SF, leaving 30 eligible participants. Of these, 15 consented to involvement, but 3 withdrew from the study prior to the first follow-up, leaving 12 participants. One participant did not attend 12 week follow-up. Characteristics of participants are shown in table 1.

Table 1
Participant characteristics (n=12)

Age, mean years (SD)	82 (7)
Male, n (%)	6 (50)
Live alone, n (%)	6 (50)
Primary diagnosis, n (%)	
Cardiorespiratory disease	4 (33)
Neurological disease	3 (25)
Other	5 (42)
Comorbidities, median count (IQR)	2.5 (2,3)
BMI, median (IQR)	24 (22.5, 28)
MNA category, n (%)	
"At risk" (17-23.5)	9 (75)
Malnourished (<17)	3 (25)
Length of stay, median days (IQR)	8 (6,9)
Dependent in 1 or more ADL at discharge, n (%)	2 (17)
Community services arranged at discharge, n (%)	6 (50)

SD: standard deviation; IQR: inter-quartile range; BMI: Body mass index (kg/m²); MNA: Mini-Nutritional Assessment; ADL: Activities of Daily Living.

Inpatient assessments, education and discharge communication required approximately 4 hours per patient. All participants received a home visit from the intervention nurse, and 10 also received a visit from the dietitian, with mean home visit duration of 55 minutes. Participants received an average of 5 phone calls (range 3-8), with a mean duration of 7 minutes per call. In addition, 10 calls (relating to 7 patients) were made to relatives, and 15 calls (relating to 4 patients) were made to primary care providers. Four participants (33%) were referred for new community services, four (33%) were commenced on oral nutritional supplements, and 7 (58%) were referred for continuing community dietetic follow-up.

Mean reported energy intake at 6 weeks was 5800 kJ/day (SD 2000 kJ/day) or 90 kJ/kg/day; and at 12 weeks it was 6000 kJ/day (SD 1900 kJ/day) or 95 kJ/kg/day. Mean protein intake was 61g/day (SD 25 g/day) or 0.9 g/kg/day at 6 weeks and 64g/day (or 1.0 g/kg/day) at 12 weeks.

Three participants (25%) lost more than 5% body weight by 6 weeks, and one further participant lost weight between 6 and 12 weeks. Two of these participants had been admitted with symptomatic

congestive cardiac failure, and resolution of fluid overload may have contributed to weight loss; one had improved their MNA score by >10% by 12 weeks, but the second failed to attend 12 week follow-up. Three of the four participants who lost more than 5% of body weight during follow-up had estimated energy intake of less than 50 kJ/kg at the 6 week follow-up, but none received liquid nutritional supplements. All had BMI >23 kg/m² at baseline, and baseline MNA scores were 21-23.5. Of the 5 participants with initial MNA of 21 or less, all maintained or improved their weight and improved MNA score by 10% or more. Three of these (60%) received liquid nutritional supplements during follow-up, and ongoing community dietetics referral.

Two of the participants with weight loss also had a decline in MNA score at 12 weeks. Each had an initial MNA score of 23.5. Both required further medical review (general practitioner review and/or hospital admission) within 12 weeks for medical issues. The remaining participants had all improved MNA score by at least 10% by 12 week follow-up. Three participants (25%) were readmitted to hospital during the 12 weeks follow-up.

Questionnaires were completed by 9 (75%) participants and their carers, and are summarised in figure 1. Personalised advice about food intake and community services were particularly valued, while generic written nutritional information and brochures were less valued. Four participants (44%) agreed that they were eating better than prior to the recent hospitalisation and 5 (55%) reported managing better with cooking and shopping. Only 2 participants reported spending more money on food than usual. Additional comments by participants confirmed that both telephone and home visits were perceived as useful and acceptable, and that the additional social and practical supports were particularly valued.

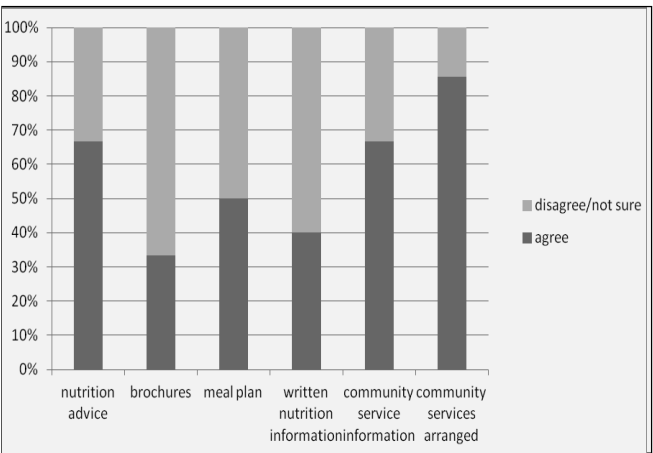


Figure 1. Participant (n=9) perception of the usefulness of specific strategies in improving eating in the post-hospital period, based on questionnaire responses.





Conclusions

The results demonstrate the vulnerability of this patient group. Despite a high level of support, energy and protein intakes were relatively poor, and one third of patients lost weight, although this may have been partly contributed to by appropriate oedema management in two heart failure patients. Two of these participants had a decline in their nutritional status (as measured by MNA) at 12 weeks. Both were considered relatively low risk at program entry by screening criteria (MNA 23.5). Participants readily identified at high risk at admission to the program (low BMI or MNA) were likely to receive oral nutritional supplements and ongoing community dietetics referral, and maintained or improved their nutritional status during follow-up. These findings have implications for targeting participants and designing intervention protocols in future trials, where weight loss may be an important independent criterion for intervention as well as baseline nutritional status (6).

The proposed model was able to be delivered as planned, and the main intervention components were acceptable to the older participants and their carers. The intervention identified a large number of unmet needs, with initiation of additional community services in one third of participants, and referral for ongoing community monitoring of nutritional status in more than half; local service data prior to the intervention suggested very few medical patients (approximately 1 per month) were being referred for community dietetics follow-up. Tailored advice and practical supports were identified by participants as greater value than generic nutrition information, and were facilitated by experienced staff who linked closely with inpatient teams and relevant community services.

We recognise that this pilot study was very small and lacked a concurrent control. Only about one third of potential participants were eligible for logistical reasons, and the consent and continuation rate (40%) reflect the challenges enrolling aged, sick patients in intervention trials. Limitations of the 24 hour recall method for nutritional intake are acknowledged, including the potential variability in usual intake and a tendency for adults to under-report intake (15). However, the use of multiple pass methods may improve accuracy of participant recall (16, 17). Furthermore, poor reported intake at 6 weeks was observed to correlate with measured weight loss at 6 and 12 weeks. Although the MNA is recommended as a nutrition assessment instrument (13), the minimal clinically significant difference has not been well defined, and we chose a 10% change for consistency with previous studies (4).

Despite these limitations, the pilot study provides "proof of concept" for an integrated interdisciplinary post-hospital nutritional management program to provide a bridge between inpatient and community care.

The early post-hospital period is a vulnerable time (4) when the fragile physiological state of recovery from acute severe illness may be compromised by deficits in service coordination, inconsistent information sharing with patients and carers, and unexpected challenges faced on return to functioning in the community. By combining specific nutrition and service coordination expertise, we anticipate that such an intervention will address some of the barriers which have contributed to disappointing results in previous nutrition-only interventions in this patient group (18).

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