Meals Enhancing Nutrition After Discharge: Findings from a Pilot Randomized Controlled Trial

David R. Buys, PhD, MSPH; Anthony D. Campbell, MSW, MA; Alice Godfryd; Kellie Flood, MD; Elizabeth Kitchin, PhD, RD; Meredith L. Kilgore, PhD, RN; Sally Allocca, MDiv; Julie L. Locher, PhD, MSPH

ARTICLE INFORMATION

Article history:
Submitted 9 November 2015
Accepted 9 November 2016
Available online 5 January 2017

Keywords:
Older adult nutrition
Nutritional risk
Home- and community-based services
Home-delivered meals

http://dx.doi.org/10.1016/j.jand.2016.11.005

ABSTRACT

Background After older adults experience episodes of poor health or are hospitalized, they may not return to premorbid or prehospitalization eating behaviors. Furthermore, poor nutrition increases hospital readmission risk, but evidence-based interventions addressing these risks are limited.

Objective This pilot study's objective was to evaluate the feasibility of conducting a randomized controlled trial assessing a post-discharge home-delivered meal program's impact on older adults' nutritional intake and hospital readmissions and to assess patient acceptability and satisfaction with the program. The aims of the study were to evaluate successful recruitment, randomization, and retention of at least 80% of the 24 participants sought; to compare the outcomes of hospital readmission and total daily caloric intake between participants in the intervention and control groups; and to assess patient acceptability and satisfaction with the program.

Design This study used a two-arm randomized controlled trial design, and baseline data were collected at enrollment; three 24-hour food recalls were collected during the intervention period; and health services utilization and intervention satisfaction was evaluated 45 days post-discharge.

Participants/setting Twenty-four patients from the University of Alabama at Birmingham Hospital's Acute Care for Elders (ACE) Unit were enrolled from May 2014 to June 2015. They were 65 years or older; at risk for malnutrition; cognitively intact; able to communicate; discharged to a place where the patient or family was responsible for preparing meals; and diagnosed with congestive heart failure, chronic obstructive pulmonary disease, acute myocardial infarction, or pneumonia. Final analysis included 21 participants.

Intervention The intervention group received 10 days of home-delivered meals and nutrition education; the control group received usual care and nutrition education.

Main outcome measures The main outcome was intervention feasibility, measured by recruitment and retention goals. Hospital readmissions, caloric intake, and satisfaction with the intervention were also evaluated.

Statistical analyses performed Univariate and bivariate parametric statistics were used to evaluate differences between groups. Goals for success were identified to assess feasibility of conducting a full-scale study and outcomes were measured against the goals.

Results Of the randomized participants, 87.5% were retained for final data collection, indicating that this intervention study is feasible. There were no significant differences between groups for hospital readmissions; however, caloric intake during the intervention period was greater for intervention vs control participants (1,595 vs 1,235; P=0.03). Participants were overwhelmingly satisfied (82% to 100% satisfied or very satisfied) with staff performance, meal quality, and delivery processes.

Conclusions Conducting a randomized controlled trial to assess outcomes of providing home-delivered meals to older adults after hospital discharge in partnership with a small nonprofit organization is feasible and warrants future research.
J Acad Nutr Diet. 2017;117:599-608.

HOSPITAL READMISSIONS AFFECT ONE IN SIX MEDICare patients released after medical care and one in eight patients after surgery.[1] It is estimated that these readmissions cost more than US$17 billion.[2] This is especially critical because Medicare "is the federal health insurance program for people who are 65 or older."[3] Effective October 1, 2012, the Hospital Readmissions Reduction Program, mandated by the Patient Protection and Affordable Care Act, began reducing payments to hospitals that have excess readmissions.[4] Concomitant with this change, several groups,

including the Academy of Nutrition and Dietetics, have joined together to form The Alliance to Advance Patient Nutrition. The Alliance has as a major emphasis on the elimination of hospital malnutrition through appropriate nutritional intervention, including interventions delivered at discharge.[5]

Krumholz recently described in *The New England Journal of Medicine* a "post-hospital syndrome" that is characterized by poor nutrition.[6] He noted post-hospital syndrome "receives little attention," and argued that strategies for mitigating the risk should include "promoting good nutrition and addressing nutritional deficiencies."[6] Malnutrition occurs in 20% to 70% of older adults who are hospitalized, and in up to 49% of older adults who have been recently discharged from the hospital.[7] Previous work on this issue has found that older adults who experience nutritional risk are more likely to be subsequently hospitalized[8] and that those discharged with malnutrition have higher risk of mortality within the year after their hospitalization.[9] Furthermore, prior hospitalization has also been associated with poorer nutritional status.[10] Vaudin and Sahyoun[11] found that food anxiety was high among recently hospitalized older adults and was associated with poor health status. Concerns about post-discharge nutrition-related care persist in international contexts as well as the United States, including in Australia, where one study found "few patients at nutrition risk received nutrition-focused care in the post-hospital period."[12] Other studies suggest that collaboration between different health services providers is an important step to addressing these concerns.[13,14]

Hospitals throughout the United States have responded to both changes in Medicare policy and increased recognition of the role of malnutrition in contributing to poorer health outcomes and potentially avoidable readmissions. They are now initiating many nutrition interventions, including hospital-to-home transition programs that sometimes include home-delivered meals.[15,16] A systematic review evaluating whether home-delivered meals improves patient outcomes was recently published; no studies were identified that demonstrated an effect of home-delivered meals on hospital readmissions.[15]

While a full-scale study to test the hypothesis that providing home-delivered meals post-hospital discharge reduces older adults' risk for preventable readmissions is needed, this pilot project was conducted as a first step with the following aims: to evaluate successful recruitment, randomization, and retention of at least 80% of the 24 participants sought; to compare the outcomes of hospital readmission and total daily caloric intake between participants in the intervention and control groups; and to assess patient acceptability and satisfaction with the program.

MATERIALS AND METHODS

The Meals Enhancing Nutrition After Discharge (MEND) pilot study was conducted between May 2014 and June 2015 at the University of Alabama at Birmingham (UAB) in collaboration with PEER (Promoting Empowerment and Enrichment Resources), Inc.[17] The research protocol was approved by the UAB Institutional Review Board and all participants gave written informed consent.

Sample

Based on previous research regarding ideal sample size for the conduct of pilot studies, the investigators sought 24 participants for the study.[18] Inclusion criteria required that participants be at least 65 years old; able to communicate alone or through a caregiver; discharged to a private residence or a facility where the patient was responsible for preparing their own meals; be at risk of malnutrition, defined as scoring <24 on the Mini Nutritional Assessment[19]; and have a diagnosis of congestive heart failure, chronic obstructive pulmonary disease, acute myocardial infarction, or pneumonia. These specific conditions were chosen because hospitals are now penalized under the Affordable Care Act for readmission within 30 days of discharge after an admission with these diagnoses. Penalties may include payment adjustments of up to 3% reduction in reimbursement.[4] Exclusion criteria were a diagnosis of dementia (based on clinical reports from medical staff in rounds), terminal illness, cancer diagnosis within the last 5 years, end-stage renal disease, feeding tubes, ventilator dependence, or out of delivery range (>20 miles from PEER, Inc).

Recruitment

Patients were recruited at the UAB Hospital Acute Care for Elders (ACE) Unit[20] by graduate research assistants in collaboration with full-time clinical staff on the unit at daily rounds. Potentially eligible patients were screened and recruited at the bedside and provided written informed consent. Participants then completed the baseline assessment, which was administered by graduate research assistants.

Randomization

Participants were assigned, based on a 1:1 allocation, to the intervention or control condition using a randomization schedule created from a computerized random-number–generating algorithm. To ensure allocation concealment from research staff before assignment, the randomization schedule was held by the principal investigator's administrative assistant in sequentially numbered, opaque, sealed envelopes. After assignment, the graduate research assistant or principal investigator notified the community partner, PEER, Inc, of participants who were assigned to receive meals.

Control: Nutrition Education Group

Control participants received the care or treatment as prescribed by their attending physician or nurse practitioner (usual care) and the *What's On Your Plate? Smart Food Choices for Healthy Aging* book created by the National Institute on Aging.[21]

Intervention Arm: Nutrition Education Plus Home-Delivered Meals Program

In addition to usual care and receipt of *What's On Your Plate? Smart Choices for Healthy Aging*,[21] the intervention group received three meals per day for 10 days. Ten days was selected because that is what is currently being done by some insurers who are providing meals post-discharge. Meals were prepared by a local church and delivered by PEER, Inc, a local 501(c)3 organization that serves a low-income neighborhood in Birmingham, AL, with programming around healthy lifestyles and access to healthy foods. Among other food-related programs,[22] the organization rents space from an urban church that has a health department–approved kitchen