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Multidisciplinary nutritional support for undernutrition in nursing home and home-care: A cluster randomized controlled trial

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ABSTRACT

Objective: To assess the effect of multidisciplinary nutritional support for undernutrition in older adults in nursing home and home-care identified with the validated Eating Validation Scheme (EVS).

Methods: An 11 wk cluster randomized trial with a home-care (3 clusters) or nursing home (3 clusters) setting as the unit of randomization. Before starting the study, a train-the-trainer course was performed to educate the nutrition coordinators. In addition to the nutrition coordinator, the participants assigned to the intervention group strategy received multidisciplinary nutrition support. Focus was on treatment of the potentially modifiable nutritional risk factors identified with the EVS, by involving the physiotherapist, registered dietitian, and occupational therapist, as relevant and independent of the municipality's ordinary assessment and referral system. Outcome parameters were quality of life (by means of EuroQol-5D-3L), physical performance (30-seconds chair stand), nutritional status (weight and hand-grip strength), oral care, fall incidents, hospital admissions, rehabilitation stay, moving to nursing homes (participants from home-care), and mortality.

Results: Respectively, 55 (46 from 2 home-care clusters) and 40 (18 from 1 home-care cluster) were identified with the EVS and comprised the intervention and control group. A difference after 11 wk in quality of life (0.758 [0.222] versus 0.534 [0.355], $P = 0.001$), 30-seconds chair stand (47% versus 17% improved, $P = 0.005$) and oral care (1.1 [0.3] versus 1.3 [0.5], $P = 0.021$) was observed. There was a almost significant difference in mortality (2% versus 13%, $P = 0.079$).

Conclusions: Multidisciplinary nutritional support in older adults in nursing home and home-care could have a positive effect on quality of life, muscle strength, and oral care.

Introduction

Elderly adults in nursing home and home-care are a particularly high-risk population for weight loss or poor nutrition [1]. In Denmark, as many as 50% of elderly adults in nursing homes suffer from unintended weight loss and reduction of appetite. 20% of the nursing home residents and 12% of the home care clients have a body mass index (BMI) below 18.5 [2,3].

The negative consequences of undernutrition are numerous, i.e. increased risk for morbidity and mortality, impaired cognitive, physical, and social function and hence, reduced quality of life, increased health care costs, hospital stays, more general practitioner visits, more intensive nursing care, and increased requirement of nursing home-care [1].

Several potentially modifiable nutritional risk factors increase the likelihood of weight loss or poor nutrition [4,5]. Even though there is increasing evidence that the use of oral

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nutritional support (ONS) among nursing home residents improves weight and reduces mortality [6], the evidence for a benefit among elderly adults in home-care is very limited [6]. In addition, a more structured and multidisciplinary approach, focusing on the significant modifiable nutritional risk factors that includes involving dietitians, occupational therapists, and physiotherapist, to achieve additional nutritional benefits. Recently, the Danish National Board of Social Services developed a nutritional tool, Eating Validation Scheme (EVS), which is designed for use among nursing home residents and home-care clients, which includes eating habits, recent weight loss, and the potentially modifiable nutritional risk factors, including eating dependency, leaving 25% or more of food uneaten at most meals, and chewing and swallowing problems, with the aim of using this information in a multidisciplinary approach as needed [7]. In contrast to other nutritional tools developed for elderly people, EVS includes both a screening part and an intervention part. EVS has been validated based on a literature search and seemed capable of distinguishing those clients and residents with a positive benefit from those that showed no benefit of nutritional intervention [7]. These results need to be confirmed by a proper randomized controlled trial, where the benefits of a multidisciplinary nutritional intervention aimed at residents and clients, who are identified by means of EVS, are assessed. In addition, a recent systematic review of the effect of multidisciplinary interventions identified only two studies performed among nursing home residents (none among home-care clients), with very few relevant outcomes reported, making it impossible to conclude if multidisciplinary interventions were effective [8].

The aim of this study was to assess the effect of multidisciplinary nutritional support for undernutrition in elderly adults in nursing home and home-care, identified with the EVS. The study was part of a cost-effectiveness study funded by the Danish National Board of Social Services.

Materials and methods

Design and randomization

This study was designed as an 11 wk randomized controlled trial assessing the benefits of a new model for multidisciplinary nutritional support. To avoid contamination from the intervention, the participants were randomized in clusters, with home-care or nursing home as the unit of randomization (16). Hence, the clusters consisted of the participating nursing homes (3 clusters, see below) and home-care areas (3 clusters). Due to the limited knowledge about the benefit of nutritional support among home-care clients, the aim was to randomly assign 2 of the 3 home-care clusters to the intervention group. Randomization was performed by a researcher not involved in the study. The researchers for this study included the research assistants (AGC, BSH, SD-S, and TKSM) and the primary investigator (AB), who were not blinded for the intervention. Before starting the analysis the primary investigator (AB) was reblinded for participants' group assignment.

Population, inclusion, and exclusion criteria

The study comprised all three home-care areas in the municipality of Frederiksberg, with specific focus on participants receiving assistance with meals. Furthermore, two nursing homes had accepted an invitation to participate. One of these was very large and was therefore divided in two clusters. Elderly people (65 + years of age) receiving home-care or living in the two nursing homes with an EVS (see below) made by the nursing staff caregivers and, according to the staff caregivers, able to complete the planned tests were invited to participate. Participants were excluded from the study when they were not able or willing to give informed consent. The protocol for this study was sent to the Danish Ethical Board, which concluded that approval was not needed from the study participants and that the project could be carried on as described. Still, informed consent was obtained from all participants.

Nutritional status

Participants were eligible for this study if they were identified with 2 points according to EVS [7]. EVS contains information about eating habits, recent unintended weight loss, and the presence or absence of potentially modifiable nutritional risk factors (eating dependency, chewing, and swallowing problems, acute disease, or acute change in chronic disease). The information is combined to give a total number of points, 0 point (no risk), 1 point (at risk), and 2 points (benefit from intervention) (see Appendix 1).

Control group

Before starting the intervention, a nutrition education program was performed during the autumn and winter of 2012, educating selected staff members from the participating home-care and nursing homes to accept the role as nutrition coordinator. The education of the nutrition coordinator included three whole-day courses plus train-the-trainer sessions with other staff members (based on [9]) and local study circles in-between [10]. The overall aim was to learn how to work with EVS and specifically how to use the gathered information in a multidisciplinary approach as needed. The nutrition coordinators were present in both the control and the intervention group. Also, in both groups', standard interventions from physiotherapist, registered dietitian, occupational therapist, and care dentistry was requested through the municipality's normal assessment, and referral system was maintained.

Intervention group

In addition to the educated nutrition coordinator, the participants assigned to the intervention group strategy received the new model for multidisciplinary nutrition support during the 11 wk study. Focus was on individual treatment of the potentially modifiable nutritional risk factors identified by the EVS, by involving physiotherapist, registered dietitian, and occupational therapist, as relevant according to the EVS and independent of the municipality's ordinary assessment and referral system. The intervention was coordinated by the principal investigator (AB) and the four research assistants (AGC, BSH, SD-S, and TKSM) and contained a formalized multidisciplinary collaboration, including a meeting once a week to discuss, evaluate, and adjust the multidisciplinary support of each of the participants (Fig. 1).

Physiotherapist intervention

All participants in the intervention group were offered 30 to 45 min exercise programs of moderate intensity twice a week. Focus was on strength and balance [11,12] supervised by physiotherapists affiliated to the study. The intervention group received one bottle (125 mL) of an oral training supplement immediately after the two weekly exercise bouts. The oral training supplement provided an average of 1010 kJ and 14.4 g of protein per 100 mL and there were different flavors to choose from. If a participant did not attend the group exercise, the supplement was offered when possible.

Registered dietitian intervention

The registered dietitian affiliated to the study was asked to consult the participants in the intervention group with unintended weight loss according to the EVS or the weekly assessment of weight. The nutritional support was documented in a treatment protocol and based on the official recommendations [13]. The individual follow-up was in participant's home, during group exercise, or by telephone. In addition, contact was made with the caregivers, food service supplier, general practitioner, and other care providers as required.

Occupational therapist intervention

The occupational therapist affiliated with the study was asked to consult the participants who suffered from eating dependency (i.e. needed assistance from staff or special cutlery) or chewing and swallowing problems, according to the EVS. The task of the occupational therapist was to determine if the participant actually had swallowing or chewing problems [14,15], or if any help during meals was needed, and initiate intervention to solve these problems. There was follow-up as needed, in participant's home, during the group exercise, or by telephone. In addition, contact was made to caregivers, food service suppliers, dental hygienists, the visitation for the referral of eating aids, and other care providers as required.

Compliance with intervention strategies

The physiotherapists documented the consumption of ONS (recorded as 1, ¾, ½, or ¼ portion consumed). After each exercise bout, the physiotherapist recorded each participant's attendance, training intensity, and potential adverse