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Research report

Higher food intake and appreciation with a new food delivery system in a Belgian hospital. Meals on Wheels, a bedside meal approach ☆ A prospective cohort trial

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ABSTRACT

Aim: A new system of meal distribution called Meals on Wheels, allowing food ordering at mealtime and providing guidance by trained nutritional assistants, might show benefit in offering nutritional support. This study investigates whether Meals on Wheels improves total food intake per day and yielded improved appreciation of food quality and increased access to food and mealtimes. *Methods:* In a prospective cohort trial where control and intervention groups were taken from all patients hospitalized at the respiratory disease department, age, sex, BMI, admission weight, height, reason for admission and discharge weight were noted, as was food intake, supplements, waste per meal and daily total. For food appreciation the questionnaire developed by Naithani et al. was used. The study included 83 patients in the control group and 106 patients in the Meals on Wheels group. *Results:* Mean total daily food intake was 236 g higher in patients in the Meals on Wheels than in controls. There was higher intake of oral nutritional supplements in the Meals on Wheels group compared to controls, resulting in significantly less oral nutritional supplements wasted. There was also significantly less waste in the Meals on Wheels group. For food access and appreciation, patients appreciated Meals on Wheels more than the old system in terms of choice, hunger, food quality and organization. *Conclusions:* Meals on Wheels resulted in higher food intake during each meal, less waste and better use of oral nutritional supplements. Patients appreciated Meals on Wheels more than the old system in terms of choice, hunger, food quality and organization.

Introduction

Many studies showed that malnutrition is common in hospitals (Norman, Pichard, Lochs, & Pirlich, 2008) and is associated with increased complication rates (Loser, 2010; Norman et al., 2008; Sullivan, Patch, Walls, & Lipschitz, 1990), hospital stay (Edington et al., 2000; Norman et al., 2008; Pichard et al., 2004), mortality (Kagansky et al., 2005; Loser, 2010; Norman et al., 2008) and medical costs (Correia & Waitzberg, 2003). Malnutrition is often the result of a poor nutritional intake due to less appetite or disease symptoms, or can be associated with the catabolic processes of the illness.

Disease-related malnutrition is present in 20–60% of patients who are hospitalized. In addition, it is often seen that the nutritional status of patients significantly deteriorates during hospital stay (Bistrian, Blackburn, Hallowell, & Heddle, 1974; Kelly et al., 2000; Kondrup et al., 2002; Loser, 2010; Schindler et al., 2010). Both acute and chronic lung disease have an increased risk of malnutrition. It is estimated that 25–40% of patients with advanced COPD are malnourished leading to increased morbidity and mortality (Anker et al., 2006). Lung cancer is also associated with a high risk for malnutrition in patients due to both the course of the disease and the treatment. The importance of nutritional interventions in patients with cancer was shown in the literature. Counseling in nutrition has been shown to improve quality of life,

Abbreviations: BMI, body mass index; CI, confidence interval; COPD, chronic obstructive pulmonary disease; IQR, interquartile range; MOW, Meals on Wheels; SD, standard deviation.

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strengthen response to therapy and increase survival (Moreland, 2010).

Not only disease related factors contribute to malnutrition. Several studies suggest that hospitalized patients often receive a less than optimal level of nutritional care due to lack of training and awareness of hospital staff (Kondrup et al., 2002; Patel & Martin, 2008; Rasmussen et al., 2004). Current food intake and access in Belgium is hampered by several factors. Patients need to estimate their appetite in advance, as ordering food takes place 24 h beforehand. Conversely, hunger can change drastically over night as patients might feel better or worse, altering their appetite. Secondly, due to the different therapeutic and diagnostic interventions, mealtimes are often missed or meals are left cold and tasteless. Lastly, patients sometimes do not get what they ordered, giving them food they might not like. This might result in a skipped meal, thus inducing hunger. Not eating or not having enough food are two important reasons for inducement of hunger (Nelson, Brown, & Lurie, 1998).

The present structure of meal distribution in hospitals makes it complicated to offer an adequate nutritional support to each patient from admission to discharge (Naithani, Whelan, Thomas, Gulliford, & Morgan, 2008). Recently, a new concept of food delivery has been introduced in hospital setting, an idea derived from home-served meal companies. Meals are ordered and delivered bedside at the same moment, allowing the patient to meet their current appetite. Moreover, individual mealtimes are evaluated and guided by trained nutrition assistants instead of nurses, allowing a closer follow-up of the patient's food intake and giving better support and information. This flexibility and instantaneous access to food has given rise to its current name, Meals on Wheels (MOW). Similar systems have been successfully implemented in pediatric health care facilities (Kuperberg, Mager, & Dello, 2009).

The aim of the study was to investigate whether total food intake, appetite, appreciation and food access improve when MOW is introduced in a hospital setting. The hypothesis was that a bedside approach where the delivered food is tailored to the patient's current appetite and guided by nutritional assistants, will result in more intake of food. It was also estimated that this approach will positively influence the perception and appreciation of the patient on meals during hospital stay.

Methods

Ethical committee

This prospective cohort study was approved by the ethics committee of AZ Nikolaas hospital and all patients gave written informed consent before participation.

Patient selection

The control group included all patients who were hospitalized at the department of respiratory disease between 1st February 2010 and 28th February 2010. All patients hospitalized from March 1st 2010 to March 31st 2010 were included in the MOW intervention group.

Control and intervention

In the control group the current system was evaluated, where patients ordered their meals (breakfast, lunch and dinner) one day beforehand at the nutritional assistant. That same day, breakfast is individually portioned in the externally located hospital kitchen and transported to the hospital where they are cold-stored and delivered to the patient at breakfast one day after ordering. Warm meals (lunch) and dinner are individually portioned and transported cold-stored from the kitchen 4–6 h before mealtime. At the hospital, meals are heated by contact heat produced by the food carts and brought to the department where the patient will receive his order one day after ordering. These carts allow only one set temperature for heating and have no cold compartment.

In the intervention group (Meals on Wheels group), a different type of food cart was used with both a refrigerator and a heating compartment, allowing four different preset temperatures. The same food components as in the control group were transported from the kitchen to the hospital and cold-stored. At mealtimes the day after transportation, food carts were filled with the different food components for the meal, heated at ideal temperature for each component. No portioning took place in the kitchen. Patients were then asked by the nutritional assistant how much and what they wished to eat at that specific mealtime. Individual portioning took place bedside.

Aims

The primary aim was to investigate whether MOW significantly improved total food intake per day, defined by g/day. Subanalysis was done to evaluate whether there was a difference between the different mealtimes, between different underlying pathologies and for oral nutritional supplements. The secondary aim was to see if there was an improved appreciation of food service and increased access to food and mealtimes in the MOW system.

Data collection

In both the intervention and control group, quantity of food intake per meal per patient was calculated by subtracting the weight at the end of the meal from the weight at serving time. This was then defined as the total food intake during that meal, including oral nutritional supplements. This procedure was repeated for each patient during each mealtime during the whole length of their stay. The amount of waste was also recorded for further analysis. All data were measured and collected by the nutritional assistant. Oral nutritional supplements in this hospital are ready to drink or eat, high calorie, rich in protein nutritional supplements with added vitamins, minerals and trace elements (Fortimel® Regular, Fruit, Crème, Compact or Extra). These supplements were measured for each patient per day during their stay. At discharge, a daily average of supply and intake was calculated by dividing the total intake and supplement supply by the total number of days. On a daily basis, patients were asked by the nutritional assistant if any extra snacks were eaten. If so, the weight of the snack was searched and calculated into the daily intake. When patients were transferred to another department due to medical or practical reasons, follow-up was stopped. Other parameters collected were reason for admission defined as the causing pathology, weight, height, body mass index (BMI), age, sex, food appreciation and access questionnaire.

Questionnaire

The questionnaire developed by Naithani et al. to evaluate food appreciation and accessibility was used. This is a valid and reliable questionnaire to measure hospital food access and is able to reveal problems in food access (Naithani, Thomas, Whelan, Morgan, & Gulliford, 2009). The questionnaire was provided by the author (Naithani, S.) of the original article and contained the five basic themes (feeling hungry, physical barriers, organisational barriers, food choice and food quality) and a sixth part termed 'effects of illness and treatment', evaluating the effect of the disease and the treatment on the amount of food eaten.