

Original article

Mealtime habits and meal provision are associated with malnutrition among elderly patients admitted to hospital[☆]

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SUMMARY

Background & aims: Large-scale studies performed in hospitals with the validated Mini Nutritional Assessment (MNA) tool are scarce. However, factors associated with malnutrition are important for identifying individuals at risk. The aims of the present study were to estimate the prevalence of malnutrition and to examine the association between mealtime habits, meal provision, and malnutrition among elderly patients admitted to hospital.

Methods: This cross-sectional study included patients aged ≥ 65 years admitted to internal medicine, surgical or orthopaedic wards. The MNA was used for their nutritional assessment, and factors potentially associated with malnutrition were recorded.

Results: Of 1771 patients (mean age 78 years), 35.5% were well-nourished, 55.1% were at risk of malnutrition and 9.4% were malnourished. Overnight fasts exceeding 11 h, fewer than four eating episodes a day, and not cooking independently were associated with both malnutrition and risk of malnutrition.

Conclusions: The risk of malnutrition was high among elderly patients admitted to hospital, whereas the proportion with fully developed malnutrition was lower than expected. A long overnight fast, few eating episodes, and not cooking independently were associated with an increased risk of malnutrition. Knowledge of these factors when providing care to the elderly may assist health-care professionals to prevent malnutrition.

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1. Introduction

The occurrence of protein-energy malnutrition (malnutrition) in hospitals has been acknowledged for many years,¹ but it is still a problem worldwide.² In Europe, the prevalence of malnutrition

among elderly patients in hospitals has been reported to be 23–39% when assessed with the Mini Nutritional Assessment (MNA) tool,^{2–4} an instrument developed to identify elderly patients (≥ 65 years) either with malnutrition or at risk of it.³ The identification of patients with a poor nutritional status in hospitals is central to the provision of proper treatment, because the condition is associated with increased morbidity^{5,6} and mortality.^{7–9} However, in Sweden, no large-scale study has used the MNA for the nutritional assessment of elderly patients admitted to hospital.^{6,8,10} It is important to obtain up-to-date data on the prevalence of malnutrition to increase our awareness of elderly patients admitted to hospitals who are at risk of malnutrition.

It is also necessary to identify the factors associated with malnutrition to facilitate the identification of elderly with a poor nutritional status. Factors previously shown to be associated with malnutrition are age^{4,11,12} and certain diagnoses and conditions, such as dementia,^{4,13} depression,^{4,13} and functional dependence.^{11,13} Other factors suggested to be related to health outcomes

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are mealtime habits, such as the overnight fast,¹⁴ the number of eating episodes,¹⁵ and meals on wheels.^{9,16} However, the association between mealtime habits, meal provision and malnutrition in the elderly remains unclear.

According to the recommendations for food and nutritional care in European hospitals, eating episodes should be spread out over the day to cover most of the waking hours,¹⁷ thereby reducing the length of the overnight fast. This also ensures sufficient time between each meal to allow between-meal snacks in the morning, afternoon, and late evening¹⁷ to generate a sufficient energy and nutrient intake. In the Nordic countries, these recommendations are even more specific, stating that the overnight fast should not exceed 11 h in the elderly, and that the individual should have at least four eating episodes a day.¹⁸ However, no clinical studies have been undertaken to support the Nordic recommendations; e.g., to confirm that the length of the overnight fast or number of eating episodes is associated with the prevalence of malnutrition.

The aims of the present study were to estimate the prevalence of malnutrition and to examine the associations between mealtime habits, meal provision, and malnutrition among elderly patients admitted to a medium-sized Swedish hospital. The primary hypothesis was that the length of the overnight fast and the number of eating episodes are associated with malnutrition. The secondary hypothesis was that meal provision is associated with malnutrition.

2. Materials and methods

2.1. Study design and setting

This cross-sectional study was conducted over 15 months from March 2008 to May 2009, at a medium-sized county hospital in central Sweden. The hospital, with a total of 443 beds, serves

a population of approximately 250,000 inhabitants. Nutritional assessment was performed with the MNA instrument during the patients' hospital stays, and factors potentially associated with malnutrition were recorded.

2.2. Study participants

A total of 2717 patients were assessed for their eligibility to participate in the study. The inclusion criterion was that each patient was ≥ 65 years old when admitted to hospital. The reasons for exclusion are shown in Fig. 1. The final sample consisted of 1771 patients in two internal medicine wards ($n = 706$), two surgical wards ($n = 681$), and one orthopaedic ward ($n = 384$). The patients were recruited consecutively during the study period, except on weekends, holidays, and when the wards were closed because of a calicivirus outbreak.

2.3. Patient characteristics

The data collected were age, sex, body mass index (BMI), waist circumference, and smoking status (current or non-smoker). Medicine use before admission and the patient's diagnosis at discharge were collected. The diagnoses were registered according to the International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10).

The patients were asked about their length of overnight fasts, defined as the period between the last eating episode in the evening and the first eating episode the following morning. The number of eating episodes per day was recorded by asking the patients how often they usually ate breakfast, lunch, dinner, and between-meal and evening snacks. How meals were provided (meal provision) was registered as: cooks independently and/or with help from his/her spouse (cooks independently), meals on

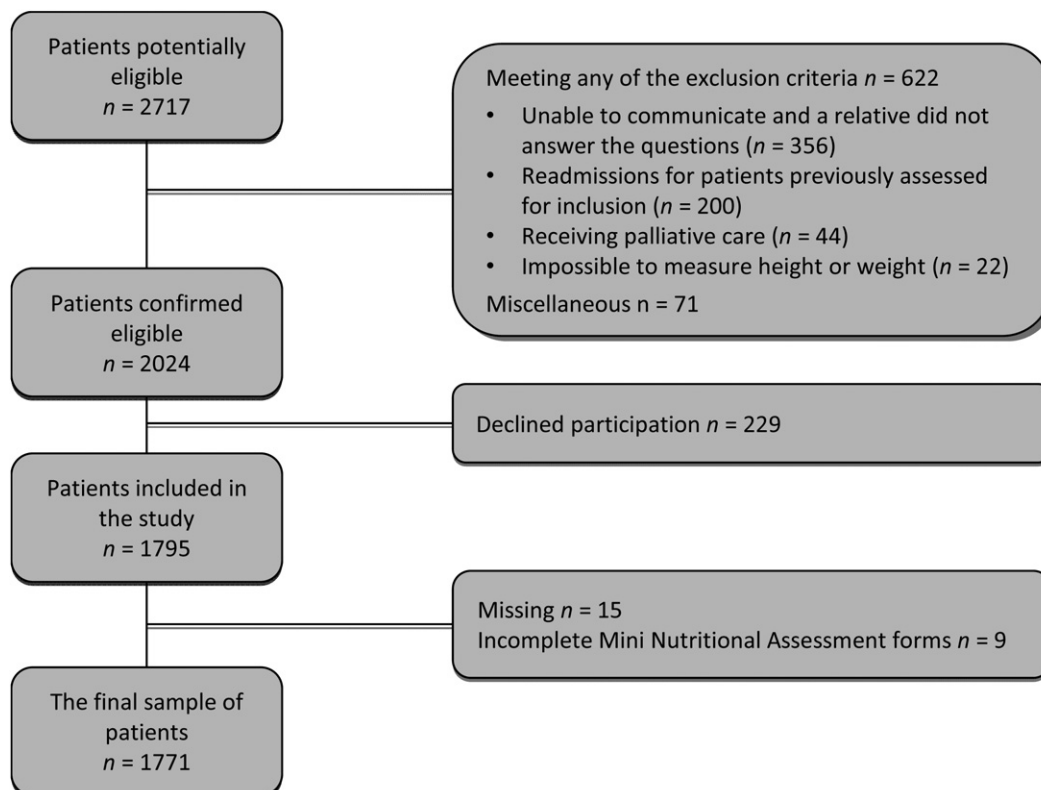


Fig. 1. Flow chart showing patient recruitment.

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