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Original article

Use of health resources and healthcare costs associated with nutritional risk: The FRADEA study

Marta Martínez-Reig [a], Isaac Aranda-Reneo [b], Luz M. Peña-Longobardo [c], Juan Oliva-Moreno [c], Núria Barcons-Vilardell [d], Emiel O. Hoogendijk [e], Pedro Abizanda [a, f, *]

[a] Geriatrics Department, Complejo Hospitalario Universitario de Albacete, Albacete, Spain
[b] Department of Economic Analysis and Finance, Universidad de Castilla-La Mancha, Talavera, Spain
[c] Department of Economic Analysis and Finance, Universidad de Castilla-La Mancha, Toledo, Spain
[d] Medical Affairs Department, Nestlé Health Science, Barcelona, Spain
[e] Department of Epidemiology & Biostatistics, EMGO+ Institute for Health and Care Research, VU University Medical Center, Amsterdam, The Netherlands
[f] CIBERFES, Instituto de Salud Carlos III, Ministerio de Economía y Competitividad, Spain

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SUMMARY

Background: In spite of its high prevalence and its clinical relevance, the economic impact of malnutrition has not been sufficiently explored.
Objective: To study whether malnutrition predicts total hospital healthcare costs and costs related to specialist visits, emergency department visits and hospitalization in older adults.
Methods: Concurrent cohort study in Albacete City, Spain. The study sample included 827 subjects aged 70 and over from the FRADEA Study. Mini Nutritional Assessment®-Short Form (MNA®-SF) was recorded at baseline. Use of hospital resources (hospital admissions, emergency visits, and specialist visits), and hospital healthcare costs were recorded at follow-up. Generalized linear models (GLM) adjusted for age, sex, comorbidity, polypharmacy, and disability in basic activities of daily living were used to estimate the impact of nutritional factors on total healthcare costs per person/year (€ base year 2013) as well as specialist visit costs, emergency department visit costs and hospitalization costs.
Results: The average cost associated with the use of health resources was 1922€/year. Subjects with MNA®-SF between 0 and 7 had an average total health cost of 3492€/year, 2744€/year in those with MNA®-SF between 8 and 11, and 1542€/year in those with MNA®-SF between 12 and 14. Of the total health cost, 67.2% was associated with hospital admission costs. Adjusted healthcare costs were 714€/year greater in subjects with malnutrition or nutritional risk. Subjects with malnutrition or nutritional risk presented an increased adjusted risk of hospitalization (OR1.72, 95% CI 1.22–2.43).
Conclusions: Malnutrition assessed by MNA®-SF is a prognostic factor of high healthcare cost and use of resources in older adults.

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1. Introduction

Malnutrition is a common condition among older adults, with different prevalence data depending on the population and the assessment methods used. Kaiser et al. analyzed pooled results of malnutrition and being at risk of malnutrition in community-dwelling older adults using the Mini Nutritional Assessment® (MNA®). They found a prevalence of 5.8% and 31.9% respectively, presenting higher rates in hospitalized (38.7% and 47.3%, respectively) and institutionalized populations (13.8% and 53.4%, respectively) [1].

Malnutrition is also a relevant issue in geriatric population. It has been associated with higher rates of disability [2], frailty [3], poorer quality of life [4], mortality, extended length of hospital stay, and increased risk of hospitalization and institutionalization [5–8]. Moreover, malnutrition is a cornerstone in the management of

* Corresponding author. Geriatrics Department, Hospital Perpetuo Socorro, Complejo Hospitalario Universitario de Albacete, 02006 Albacete, Spain. Fax: +34967597635.
E-mail addresses: m2reig@hotmail.com (M. Martínez-Reig), Isaac.Aranda@uclm.es (I. Aranda-Reneo), LuzMaria.Pena@uclm.es (L.M. Peña-Longobardo), Juan.OlivaMoreno@uclm.es (J. Oliva-Moreno), nuria.barcons@es.nestle.com (N. Barcons-Vilardell), e.hoogendijk@vumc.nl (E.O. Hoogendijk), pabizanda@sescam.jccm.es (P. Abizanda).

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frailty, at the center of clinical transition [9], considered one of the most important factors in disability prevention [10].

In spite of its relevance, the economic impact of malnutrition has not been sufficiently explored [11], with most of previous research focusing on hospital setting. Only a few studies have analyzed the economic impact of malnutrition in non-hospitalized older populations [12–15], showing higher costs in malnourished subjects. However, some of these studies have included young individuals [13–15], and others have restricted the analysis to nursing home populations [12]. Furthermore, none of them have used the MNA® or its short form (MNA®-SF), with good sensitivity and high correlation compared to the full version [16], the recommended instrument by the European Society of Clinical Nutrition (ESPEN) for the screening of community-dwelling older populations [17]. Cost-effectiveness of oral nutritional supplementation has also been analyzed in community-dwelling [18,19], hospitalized [20] and institutionalized [21] older adults with positive results.

The Optimal Nutrition Care for All (ONCA) was launched in 2014 to facilitate screening for risk of disease-related malnutrition/undernutrition and nutritional care implementation across Europe, to develop an aligned view on the current state of play with respect to nutritional care in a given country, and to define and reconfirm the nutritional care strategies for subsequent implementation at national level [22]. In agreement with this strategy, it has been described that economic situation influences malnutrition approach and treatment in Europe [23]. For this reason and in alignment with ONCA, it is relevant to determine malnutrition cost-related issues in at-risk populations like older adults.

The objective of the present research was to study whether malnutrition risk determined by the MNA®-SF predicts total healthcare costs and costs related to specialist visits, emergency department visits and hospitalization in a population based cohort of Spanish older adults.

2. Materials and methods

2.1. Study design and sample

Our manuscript shows longitudinal results from the FRADEA study, a population based concurrent cohort. The methodology and baseline characteristics of the sample have been previously published [24]. Briefly, 1172 subjects were randomly selected from the population older than 69 years from the health card holders census from Albacete city (n = 18,137). 993 (84.7%) individuals agreed to participate. Baseline visit was conducted in 2007–2009 by four trained nurses, the same that conducted a third wave in 2011–2013 on-site. For this study we selected participants with valid data in nutritional indicators and use of healthcare resources, and with a follow-up greater than 100 days to avoid short abandon and mortality bias (n = 827). Of these, 714 (86.3%) were alive, 111 (13.4%) died during follow-up, and 2 (0.2%) were lost for follow-up (flow chart, Fig. 1). Use of hospital health care resources and healthcare costs were determined for the complete follow-up period for every participant, and thereafter we calculated the cost/person/year in €.

2.2. Nutritional indicators

MNA®-SF was determined at baseline visit. It assesses 6 domains with a score ranging between 0 and 14 points. It evaluates anorexia, weight loss, mobility, psychological stress or acute disease, dementia or depression, and body mass index (BMI) or calf

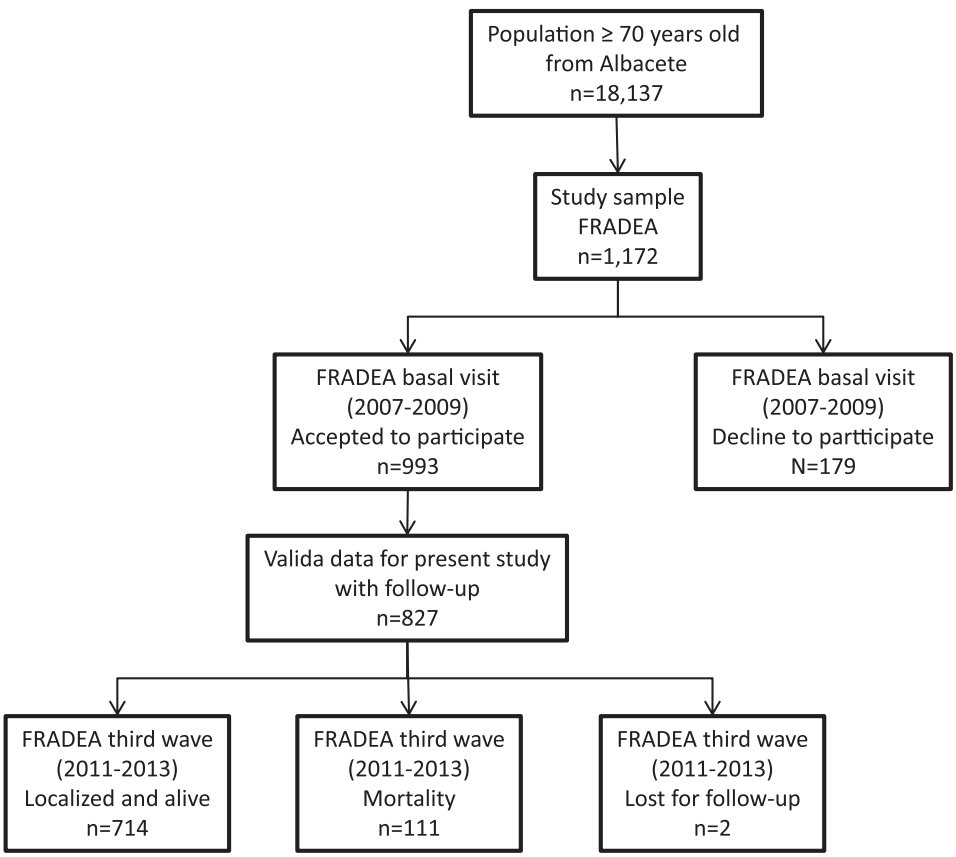

Fig. 1. Study flowchart.

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