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Quality of life, functional impairment and social factors as determinants of nutritional status in older adults: The VERISAÚDE study

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SUMMARY

Background & aims: Malnutrition is an important and growing health problem in elderly people. The main aim of this research was to examine the relationship between socio-demographic factors, social resources, functional status and quality of life and malnutrition or risk of malnutrition in elders.
Methods: A cross-sectional study was conducted with a representative sample of 749 community-dwelling elders aged 65 years and over. A comprehensive assessment was carried out, including the collection of socio-demographic factors, social resources by the Older Americans Resources and Services Scale, nutritional status by the Mini-Nutritional Assessment-Short Form, functional status by the Lawton's instrumental activities of daily living scale and quality of life by the World Health Organizations's Quality of Life measure-brief version (WHOQOL-BREF).
Results: Being female, the presence of totally impaired social resources and low scores in the physical health domain of the WHOQOL-BREF were the strongest determinants of malnutrition/risk of malnutrition. This model predicted 85.7% of the cases correctly. In men, the best determinants were being unmarried and having poor satisfaction with their health, with a percentage of 89.8% of cases of poor nutritional status correctly predicted. The best determinant for women was also the physical health domain of the WHOQOL-BREF, reaching a correct prediction of 83.0% of malnutrition/risk of it.
Conclusions: Nutritional status assessment and potential determinant factors should be incorporated as part of comprehensive assessments for early identification of malnutrition and to determine appropriate intervention strategies to address this public health problem in older adults.

1. Introduction

Malnutrition is a significant and highly frequent public health problem in older people [1], associated with higher health care costs in institutionalized and community-dwelling elderly [2]. The prevalence of risk of malnutrition varies widely, from 0% to 83%, in these older adults due to the use of different nutritional screening tools and different subject's characteristics [3]. In Spain, a prevalence of poor nutritional status among community-dwelling elderly of 14.5% was reported [4]. However, there is a high amount of malnourished older people that are unrecognized [5].

Comprehensive gerontological assessments should incorporate nutritional status or nutritional risk screening to identify the main determinants of malnutrition in older adult communities. This identification would determinate the use of appropriate interventions and follow-up to improve their nutritional status [3]. Individuals with poor nutritional status are more likely to experience poor quality of life [6], together with physical, mental and social disability [7]. A current review suggests an increase in hospitalization, morbidity and mortality in malnourished patients [2].

Body mass index, depressive symptoms, polymedication, prefrailty or frailty status, poor self-rated health [4], and cognitive impairment or chronic diseases [8] are health factors identified as determinants of nutritional status. Other authors found that social

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isolation and subjective loneliness [9], female sex, older age, unmarried status (as an indicator of social support) or low socioeconomic level [10,11] are also risk factors for poor nutritional status in elderly. Poor functional status (dependence on activities of daily living, IADL) and mental health-related quality of life also contribute to malnutrition [12,13].

Furthermore, a systematic review and meta-analysis identified different studies that found an association between nutritional status and quality of life (QOL) in older people [6]. World Health Organization (WHO) defines QOL as "*an individual's perception of their position in life in the context of the culture and value systems in which they live, and in relation to their goals, expectations, standards and concerns*" [14] and researchers must focus our studies to ensure a better quality of life in older adults, especially in those with a poor nutritional status. Intervention programs including appropriate designs to improve nutritional status significantly improve the quality of life in both physical and mental components [6].

To our knowledge, social support, functional status and quality of life have been identified, at individual level, as risk factors of poor nutritional status. Besides, no published studies associating social resources (assessed with a standardized full-scale and assessing two concepts: the satisfaction with the subject's social network, and the adequacy of social support in case of disability) and malnutrition were found. Moreover, research is not considering these multiple factors with a possible joint effect providing a joint likelihood for malnutrition or risk of malnutrition in a large elderly sample. Besides, most of the studies are involving frail or institutionalized older adults but not healthy elders, the priority for early identification of poor nutritional status.

Based on the above, the aim of this study is to examine the relationship between socio-demographic factors, social resources, functional status and quality of life and malnutrition or risk of malnutrition in a representative community-dwelling elderly population.

2. Materials and methods

2.1. Selection and description of participants

Data were used from baseline assessments from the VERISAÚDE (Effectiveness of the Comprehensive Gerontological Assessment and longitudinal follow-up in the healthy ageing promotion) project, which is a large longitudinal study (in this study, we are using the cross-sectional data) covering a sample of 749 community-dwelling subjects representative of Galician population (NW of Spain), aged 65 years and older living at their home and attending senior centers. Older adults were recruited from 43 local senior centers. The details of participants' selection and sample size estimation are given elsewhere [4].

The distribution of the sample by age and sex was similar to that of the entire Galician elderly population, according to the municipal register of the 2011 National Health Survey [15]. From October 2013 through March 2014, a Comprehensive Gerontological Assessment (CGA) was conducted.

The inclusion criteria for the participants were as follows: (a) being $\geq$65 years of age, (b) be actively enrolled in a Galician association or senior center, and (c) willingness to sign the informed consent form. The exclusion criterion for the sample was: (a) inability to perform the CGA.

2.2. Ethical statement

The study protocol was approved by the Ethics Committee of the University of A Coruña and in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki). Before the data collection, all participants were informed about the study and signed the corresponding informed consent form.

2.3. Variables and instruments

The instruments were administered by a multidisciplinary team of professionals with experience in gerontological assessment (clinical psychologists, nurses, occupational therapists, and social workers) that were trained to unify criteria.

2.3.1. Socio-demographic factors and social resources

Information on age, sex and educational level was self-reported. Educational level was categorized into three levels according to years of formal education: $\leq$8 years, 9–17 years, $\geq$18 years.

Social support was measured by the Spanish version [16] of the Older Americans Resources and Services (OARS) [17]. This scale consists of nine items, and raw scores are coded on a scale based on the following six categories: (a) excellent, (b) good, (c) mild impairment, (d) moderate impairment, (e) severe impairment, and (f) total impairment. Other three items from the OARS were also selected to assess the differences among the groups: marital status (single, married, widowed, divorced, separated), who lives with the participant (alone, spouse, children, grandchildren, parents, siblings, other kin, friends, non-related helper or other) and frequency of feelings of loneliness (often, sometimes or almost never).

2.3.2. Nutritional status

The Mini-Nutritional Assessment-Short Form (MNA-SF) [18] is made up of six questions extracted from the full MNA questionnaire [19]: appetite loss or eating problem; recent weight loss; mobility; acute disease or psychological stress; neuropsychological problems (dementia or depression); and BMI. The research staff measured weight and height according to standardized protocols. BMI was estimated by dividing weight (kg) by height^2 (m^2). A clothing adjustment of approximately 0.8 kg for women and 1.2 kg for men was made [20]. The MNA-SF has been identified, in a study including 22,007 elders, as a suitable screening tool to detect malnourished elders and those at risk for malnutrition, correlating strongly with the full MNA version ($r = 0.85$) [21]. The Spanish version of the MNA-SF was used in this study [22]. The total scores of MNA-SF screening test range from 0 to a maximum score of 14 points. Those receiving 11 or fewer points were classified as malnourished or at risk of it, whereas well-nourished individuals had 12 or more points (2 comparison groups were established in this study, low MNA-SF scores ($\leq$11) versus normal MNA-SF scores), following the dichotomization made by other studies with the MNA (normal nutritional status versus malnutrition/risk) [4,23,24].

2.3.3. Functional status

Functional status was measured using the Spanish version of the Lawton instrumental activities of daily living (IADL) scale [25,26]. The eight IADL included were as follows: using the telephone, shopping, preparing meals, housekeeping, doing the laundry, using transportation, taking medications and handling finances. Participants were asked if they had any difficulty performing each task without help from another person or special equipment. Individuals that were unable to perform any one of the activities were considered to be functionally incapacitated (IADL-dependent).

2.3.4. Quality of life

The World Health Organizations's Quality of Life measure-brief version (WHOQOL-BREF) was developed as a shortened version of the WHOQOL-100 so that it would be suitable for elderly people [27]. The WHOQOL-BREF contains 26 items, two of which are from

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