

## ASSOCIATED FACTORS WITH NUTRITIONAL STATUS AMONG OLDER SARCOPENIC PATIENTS

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DOI: 10.47122/VJDE.2023.64.6

### SUMMARY

**Objectives:** To explore some related factors to nutritional status in older people with sarcopenia treated at National Geriatric Hospital. **Subjects and Methods:** A cross-sectional study on 295 older sarcopenic patients treated at National Geriatric Hospital from June to November 2022. The nutritional status was assessed by the Mini Nutritional Assessment Short Form. **Results:** Among 295 participants, the rate of malnutrition and risk of malnutrition were 11.2% and 46.8, respectively. The prevalence of malnutrition/risk of malnutrition in groups with low educational levels, heart failure, or severe sarcopenia was significantly higher than those in groups without high educational levels, heart failure, or severe sarcopenia. **Conclusion:** Our results highlighted that educational level, heart failure, and sarcopenia classification were significantly associated with nutritional status in older sarcopenic patients.

**Keywords:** nutrition, elderly, associated factors, sarcopenia.

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Submission date: .....August 2023

Revised date: 12th August 2023

Acceptance date: 30th September 2023

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### 1. INTRODUCTION

Sarcopenia is a muscle disease rooted

in adverse muscle changes that accrue across a lifetime; sarcopenia is common among adults of older age. Sarcopenia is defined by low levels of measures for three parameters: muscle strength, muscle quantity/quality, and physical performance as an indicator of severity [1]. The global prevalence of sarcopenia was around 6-22% in people aged 65 years old or older, which increases with age and varied across regions [2].

Sarcopenia in older patients and loss of muscle mass and function is a chronic disease and is associated with deterioration of nutritional status. Anton et al. showed that the onset and progression of sarcopenia can be attributed to numerous factors including physical inactivity and poor nutrition [3]. Another research by L.M.G Verstraeten and colleagues in geriatric rehabilitation inpatients reported that sarcopenia frequently coexists with malnutrition in older patients. Of the malnourished patients with a very high rate related to sarcopenia 46% had probable sarcopenia, 0.4% had confirmed sarcopenia (non-severe) and 26% had severe sarcopenia [4]. Therefore, malnutrition is an important and urgent problem that has a significant impact on the elderly with sarcopenia.

Vietnam moved to an aging population pyramid in 2012 and the proportion of older people is increasing rapidly. Therefore, understanding more about the relationship between nutritional status and sarcopenia

is important for healthcare especially for nursing care to provide potential targets in preventing and treating sarcopenia. However, data about factors related to nutritional status are lacking regarding older sarcopenic populations. Thus, the aims of the present study were to explore some related factors to nutritional status in older people with sarcopenia treated at National Geriatric Hospital.

## 2. SUBJECTS AND METHODS

### 2.1. Subjects

Older sarcopenic patients who were 60 years old or over, were examined and treated at National Geriatric Hospital from June to November 2022. Patients were diagnosed with sarcopenia according to AWGS 2019 criteria [1] and have the physical and cognitive abilities to do a face-to-face interview.

Exclusion criteria: patients had some conditions such as mental disorders, acute and malignant diseases (advanced cancers, end-stage chronic diseases, acute myocardial infarction, acute stroke, symptomatic cardiovascular disease); severe cognitive impairment, or patients were inability to communicate.

### 2.2. Study design

- A cross-sectional descriptive study
- The sample was selected according to the convenience sampling method
- The sample size is calculated using the formula:

$$n = (Z_{1-\frac{\alpha}{2}})^2 \frac{p(1-p)}{d^2}$$

$p=0.13$  (Prevalence of malnutrition in confirmed/severe sarcopenic patients according to Verstraeten's research) <sup>11</sup>

From the formula, the estimated sample size was 272 sarcopenic patients

The number of sarcopenic patients in our study was 295 patients.

### 2.3. Variables

- General information: age, gender, educational level, weight, height, body mass index (BMI), smoking, drinking alcohol.
- Comorbidities characteristics
- The nutritional status was assessed by the Mini Nutritional Assessment (MNA-SF) [5] instrument.

The MNA-SF comprises simple measurements and 6 questions with the composite score (0-14) including food intake (0-2), weight loss (0-3), mobility (0-2), and psychological stress/acute disease (0-2). Neuropsychological problems (0-2) and BMI (0-3). Participants were scored following the tool's guidelines.

*Evaluation:* The score ranges from 0 to 14. The result was assigned into 3 groups:

- Malnourished: 0-7 points
- Risk of malnutrition: 8-11 points
- Normal nutritional status: 12-14 points
- Sarcopenia classification: according to AWGS 2019 [1]

**Criteria 1:** Low muscle mass assessed by Appendicular skeletal muscle mass/height<sup>2</sup> >2SD below the mean of the younger adult

**Criteria 2:** Low muscle strength assessed by handgrip strength: lowest 20<sup>th</sup> percentile of the study population

**Criteria 3:** Low physical performance assessed by: Gait speed <0.8 m/s

*Evaluation:*

Sarcopenia: Diagnosis is based on the presence of criteria 1 plus criteria 2 or 3.

Severe sarcopenia: Diagnosis is based on the presence of criteria 1 plus criteria 2 and 3.

### 2.4. Tools and data collection method

Data were collected by using a research

questionnaire through interviews, diagnosis tests, and medical records at National Geriatric Hospital.

**2.5. Data processing and data analysis**

The process of data coding, entry into Redcap, and analysis was done by using Statistical Package for Social Science (SPSS) software (version 22). Descriptive statistics were adopted to examine characteristic data: frequency, percentage, and mean. Inferential statistics was done to perform comparisons between groups: t-Test Chi-square. Statistical significance was accepted at the 95% confidence level (p<0.05)

**3. RESULTS**

**3.1. General characteristics**

In the total 295 sarcopenic patients, the age of the sample ranged from 60 to 97 with

the mean age being 75.7 ± 8.2 years old. The greatest distribution was generated by people aged 70-79 years old, with a percentage of 39.0%. Among participants, 22% (n=65) participants were male, less than female 78% (n=230). Almost half of the participants (47.5%) did not graduate high school, 18.6% graduated high school and 33.9% continued studying at a higher level. Regarding the habit of smoking and drinking alcohol, almost of the participants were non-smoking and non-drinking (81.4%).

Among all participants, patients who had the risk of malnutrition accounted for the highest proportion (46.8%, n=138). The rate of malnutrition was 11.2% (n=33) and normal nutritional status was 42.0% (n=124).

**3.2. Association between nutritional status and social demographic characteristics**

**Table 1.** The association between nutritional status and social demographic characteristics

Characteristics		Risk of malnutrition or Malnutrition (n=171)		Normal (n=124)		p
		n	%	n	%	
Age group	60-69	37	21.6	35	28.2	0.301
	70-79	66	38.6	49	39.5	
	≥80	68	39.8	40	32.3	
Gender	Male	38	22.2	27	21.8	0.927
	Female	133	77.8	97	78.2	
Educational level	Under high school	97	56.7	43	34.7	<0.001
	High school	23	13.5	32	25.8	
	College/university/postgraduate	51	29.8	49	39.5	
Smoking and Drinking	No	139	81.3	101	81.5	0.971
	Yes	32	18.7	23	18.5	
Mean age (year)		Mean ± SD		Mean ± SD		> 0.05
		76.6 ± 8.21		74.5 ± 8.06		

The association between educational level and nutritional status was statistically significant ( $p < 0.001$ ). Other demographic characteristics (age, gender, smoking, drinking) were also considered. However, there were no statistically significant differences.

### 3.3. Association between nutritional status and comorbidities characteristics

**Table 2.** Association between nutritional status and comorbidities characteristics

Characteristics		Risk of malnutrition or Malnutrition (n=171)		Normal (n=124)		p
		n	%	n	%	
Hypertension	Yes	105	61.4	69	55.6	0.321
	No	66	38.6	55	44.4	
Diabetes	Yes	58	33.9	45	36.3	0.673
	No	113	66.1	79	63.7	
Parkinson	Yes	37	21.6	38	30.6	0.079
	No	134	78.4	86	69.4	
Osteoarthritis	Yes	31	18.1	27	21.8	0.437
	No	140	81.9	97	78.2	
Heart failure	Yes	40	23.4	17	13.7	<b>0.038</b>
	No	131	76.6	107	86.3	
Osteoporosis	Yes	7	4.1	6	4.8	0.758
	No	164	95.9	118	95.2	

The table shows the relationship between nutritional status and heart failure ( $p = 0.038 < 0.05$ ). The prevalence of malnourished/risk of malnutrition was higher in patients with heart failure (23.5%) than that in patients without heart failure (13.7%).

Other diseases were also considered. However, there was no significant difference between these diseases and nutritional status ( $p > 0.05$ ).

### 3.4. Association between nutritional status and sarcopenia classification

**Table 3.** The association between nutritional status and sarcopenia classification

Sarcopenia classification	Risk of malnutrition or Malnutrition (n=171)		Normal (n=124)		p
	n	%	n	%	
Sarcopenia	34	19.9	56	45.2	<b>&lt;0.001</b>
Severe sarcopenia	137	80.1	68	54.8	

The relationship between sarcopenia classification and nutritional status was statistically significant ( $p < 0.001$ ).

#### 4. DISCUSSION

Our results highlighted that educational level, heart failure, and sarcopenia classification were significantly associated with nutritional status in older sarcopenic patients. This result showed that the participants with a low level of education had a higher prevalence of malnutrition/at risk of malnutrition and this difference was significant. Another author also found an association between low education and malnutrition/at risk of malnutrition ( $p < 0.05$ ) [6]. It demonstrated that a lower education level can have a higher risk of malnutrition.

Our study showed that older groups had a higher malnutrition/at risk of malnutrition. The people aged 80 or over accounted for the highest rate (39.8%). However, there was no statistically significant between nutritional status and age. It was similar to the study in community-living elderly Japanese, the rate of malnourished/risk of malnutrition in those aged over 75 was highest and the mean age was  $78.6 \pm 5.8$  [7]. It was similar to the finding of research in five nursing homes at Zaragoza that individuals aged  $\geq 80$  years were at a higher risk for EWGSOP-defined sarcopenia than those aged  $< 80$  years [8]. Besides, in other studies, we found a correlation between malnutrition/risk of malnutrition and age 80 and over ( $p < 0.001$ ) [6].

There was no significant difference between nutritional status and gender in this study. Another study in Iran also showed that males were less malnourished/at risk of malnutrition than females and it demonstrated the relationship between gender and nutritional status ( $p < 0.001$ ) [9]. We did not find a statistically significant that could be explained by our small sample size, the ratio of females and males was too different.

Our study showed that there was a relationship between nutritional status and heart failure. Besides, no relationship was found between nutritional status and other diseases. The rate of heart failure in malnourished/at-risk of malnutrition patients (23.4%) was higher than in normal nutritional status (13.7%), with  $p = 0.038$ . We also found the relationship between malnutrition and heart failure in the study of Agra Bermejo and colleagues that heart failure as a chronic disease affects the nutritional status of the patient and on the contrary, malnutrition also affects the natural evolution of the disease [10].

In our study, we found a strong relationship between nutritional status and sarcopenia classification. The proportion of severe sarcopenic patients in the malnourished/risk of malnutrition group (80.1%) was much higher than those of non-severe sarcopenic patients in the malnourished/risk of malnutrition group (19.9%). It was similar to the study of Cruz-Jentoft (2017), the rate of malnourished/risk of malnutrition in sarcopenic patients was 77.6% ( $p < 0.01$ ) [8].

A cross-sectional study by Senior et al. at a nursing home in Australia (2015), using MNA-SF to assess nutritional status, also reported that the prevalence of sarcopenic patients had malnutrition (66.7%) higher than the risk of malnutrition (38.8%) [11]. This result suggested that sarcopenic patients had poor nutritional status and easily to be malnourished. It was the same with research in four nursing homes in China (2018), malnutrition was independently associated with sarcopenia following AWGS (OR 3.29, 95%CI 1.49-7.28) [12].

#### 5. CONCLUSIONS

Our results highlighted that educational level, heart failure, and sarcopenia classification

were significantly associated with nutritional status in older sarcopenic patients.

#### ACKNOWLEDGEMENT

Nguyen Thi Thu Huong was funded by the Master, PhD Scholarship Programme of Vingroup Innovation Foundation (VINIF), code VINIF.2022.TS160

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