



Research Article

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EVALUATION OF MALNUTRITION IN GERIATRIC PATIENTS RECEIVING HOME CARE SERVICES

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Abstract

Objectives: In our study, it was aimed to determine the frequency of malnutrition and assess risk factors related to malnutrition in elder individuals receiving home care services.

Materials and Methods: This cross-sectional, descriptive study was conducted on patients who were registered to Home Care Services of Samsun Training and Research Hospital. All patients assessed sociodemographic characteristics, comorbid diseases, level of dependence, presence of pressure sore, use of nutrition supplement and nutritional status were assessed by Mini Nutritional Assessment-Short Form (MNA-SF) using face-to-face interview method.

Results: Overall, the study included 356 subjects (218 female, 61.24%). The mean age was 79.31 ± 8.60 years. Of the subjects, 42.14% (n=150) were in the age group of 75-84 years. The mean MNA-SF score was 9.20 ± 2.85 . Based on the MNA-SF score, 27.52% (n=98) of the subjects had malnutrition, while 42.69% had a risk of malnutrition. The MNA-SF score was significantly lower in males (p=0.009), in those aged ≥ 85 years (p=0.035), in those with oncological disease (p=0.002), in those with cerebrovascular disease (p=0.003), in those with dementia (p<0.001), in the presence of pressure sore (p<0.001) and in bedridden (p<0.001). In the logistic regression analysis, it was found that being gender (p=0.002), bedridden (p<0.001), oncologic disease (p<0.001), cerebrovascular disease (p=0.002), dementia (p<0.001) and presence of pressure sore (p=0.002) were independent risk factors for malnutrition.

Conclusion: The risk of malnutrition was increased in male gender, in patients aged ≥ 85 years and in those with cerebrovascular disease and dementia. The malnutrition prevalence was found to be high in patients with oncologic disease, in the presence of pressure sore and in bedridden patients.

Keywords: Malnutrition, aged, home care services.

Introduction

Malnutrition is a condition that results in regression of physical and mental functions, delayed healing, alterations in body components and several clinical consequences due to insufficient or excessive intake of protein, energy, and other nutritional elements.¹ Again, malnutrition is a clinical condition that is commonly seen with proven effects on morbidity and mortality in the geriatric population.² At old age, the mortality rate is increased by 9-38% due to malnutrition alone within 1 to 2.5 years after the onset of weight loss for any reason.³ Nutrition is affected by many changes associated with physiological, physical, psychological, cognitive, social, and environmental aging.¹ In old age, nutritional status has an important role in the development and course of diseases. The "malnutrition" and "malnutrition" risk in old age aggravate diseases already present, impair quality of life, reduce treatment success and increase healthcare costs.⁴

The malnutrition studies have been mostly conducted in elderly individuals, reporting varying malnutrition prevalence. The malnutrition prevalence varies from 2% to 32% in community-dwelling elderly, whereas 25-60% in geriatric facilities and 35-65% in hospitalized elderly.⁵ It is higher among patients receiving home care services when compared to the normal population. In studies on patients receiving home care services, it was found that the prevalence of malnutrition risk and malnutrition were 38.2-39.3% and 33.1-48.3%, respectively.³

In a study on community-dwelling elderly individuals, six risk factors were identified for malnutrition, including aging alone, requiring assistance in daily living activities, depression, chronic disease or disability, receiving home care services, and receiving care from family.⁶ Inadequate nutrition and resultant malnutrition are common in patients receiving home care services. This leads to impaired body immunity, fall and hip fracture, prolonged recovery period, increased infection, delayed wound healing, increased compression ulcers, prolonged hospitalization, and increased healthcare costs in elderly individuals.⁷ Therefore, this warrants assessment of nutritional status, risk factors for malnutrition and potential consequences of malnutrition in elderly individuals.

In elderly individuals, anthropometric measurements, laboratory tests, clinical examination and dietary content can be used as parameters to determine nutritional status.⁸ Although body mass index (BMI) is the most used anthropometric measure, BMI does not allow differentiating losses from fat tissue and muscular tissue or central obesity. Albumin and pre-albumin are the most used laboratory parameters; however, they have low specificity and sensitivity.⁹ Although recording daily dietary content is a valuable tool, it is difficult to apply and obtain accurate data.³ The European Society for Clinical Nutrition and Metabolism (ESPEN) recommends routine nutritional screening in elderly individuals.¹ It was found that Mini Nutritional

Assessment (MNA) and Mini Nutritional Assessment-Short Form (MNA-SF) can sufficiently detect inadequate nutrition.¹⁰

In Turkey, home care services are provided under the supervision of family practitioners, given that the continuity of preventive and rehabilitative care should be given effectively. As home care services have increasingly become more available in Turkey, it has become possible to plan measures and nutrition programs for the nutritional care of patients in need of special nutritional intervention. Thus, we planned to conduct a prevalence study to guide such efforts in Turkey. Our study, it was aimed to determine the frequency of malnutrition and assess risk factors related to malnutrition in elder individuals receiving home care services.

Materials and Methods

This cross-sectional, descriptive study was conducted on patients who were registered to Home Care Services of Samsun Training and Research Hospital between January 1, 2022, and March 1, 2022. The patients who were fed by oral route were included in the study after obtaining informed consent from patients and/or primary caregivers (in patients with cognitive dysfunction). Patients aged <65 years, those receiving parenteral or enteral nutrition (via nasogastric route, nasojejunal route, gastrostomy or jejunostomy), those declining participation and patients at terminal period were excluded. The study universe included 3500 patients who registered with Home Care Services of Samsun Training and Research Hospital. Participants were selected by random sampling method, and the sample size was calculated as at least 296 with 80% power, 95% confidence interval and 5% acceptable margin of error when malnutrition prevalence was accepted as 30%. In all patients assessed, sociodemographic characteristics, comorbid diseases, level of dependence, presence of pressure sore, use of enteral nutrition supplement and nutritional status were assessed by MNA-SF using face-to-face interview method.

The MNA is the most used tool to assess nutrition in elderly individuals.¹¹ The MNA was first developed in 1997, and its validity in assessing nutritional risk in elderly individuals was proven.¹² The original questionnaire includes 18 items; however, a shorter version, including six items, was developed (MNA-short form). The MNA-SF includes the following items: final weight loss, mobility, psychological stress or acute disease, neuropsychological problems, and body mass index (BMI).¹¹ The specificity and sensitivity of MNA-SF are comparable to the original MNA. The newer, shorter version has a sensitivity of 98%, specificity of 100% and diagnostic accuracy of 99% for prediction of malnutrition.¹³ Total MNA-SF score is defined as follows: 12-14 points, adequate nutrition; 8-11 points, risk of malnutrition; and 0-7 points, malnutrition. Authors have shown that MNA can adequately identify inadequate nutrition when compared to other screening tools.¹⁰ The validation study for the Turkish version was proven by Sarikaya et al.¹⁴

Data analysis

The program International Business Machines Corporation Statistical Package for the Social Sciences (IBM SPSS) version 26.0 was used in the statistical analysis of data. Descriptive statistics are presented with mean and standard deviation values for continuous data; they are presented with numbers and percentages for categorical data. The compliance of continuous data with a normal distribution was evaluated by Kolmogorov-Smirnov test. Independent groups t-test was used to compare two independent groups with parametric characteristics. Pearson Chi-square test was used to compare categorical groups. Finally, a multivariate logistic regression model was created to identify risk factors associated with malnutrition. A P value of .05 or less was used to determine statistical significance.

Results

Overall, the study included 356 subjects (218 female, 61.24%). The mean age was 79.31 ± 8.60 years. Of the subjects, 42.14% (n=150) were in the age group of 75-84 years. Of the subjects, care was given by offspring in 55.89% (n=199) and by a spouse in 19.10% (n=68). Of the subjects, 49.16% (n=175) were bedridden, while 47.47% (n=169) were semi-dependent. There was hypertension in 70.22% (n=250), cardiovascular disease in 37.07% (n=132), diabetes in 34.83% (n=124), dementia in 35.11% (n=125) and cerebrovascular disease in 33.42% (n=119). Of the subjects, 16.29% used enteral nutritional supplements. There was a pressure sore in 20.22% (n=72). The mean MNA-SF score was 9.20 ± 2.85 . Based on the MNA-SF score, 27.52% (n=98) of the subjects had malnutrition, while 42.69% had a risk of malnutrition. The nutrition was normal in 29.79% of the subjects (n=106) (Table 1).

The MNA-SF score was significantly lower in male subjects ($p=0.041$), in those aged ≥ 85 years ($p=0.027$), in those with oncological disease ($p=0.005$), in those with cerebrovascular disease ($p=0.021$), in those with dementia ($p<0.001$), in the presence of pressure sore ($p<0.001$) and in bedridden subjects ($p<0.001$). The risk of malnutrition was higher in male subjects, those aged ≥ 85 years, those with cerebrovascular disease and those with dementia ($p<0.001$). The malnutrition prevalence was increased in subjects with oncologic disease, in the presence of pressure sore and in bedridden subjects (Table 2). In the logistic regression analysis, it was found that being male gender ($p=0.002$), bedridden ($p<0.001$), oncologic disease ($p<0.001$), cerebrovascular disease ($p=0.002$), dementia ($p<0.001$) and presence of pressure sore ($p=0.002$) were independent risk factors for malnutrition (Cox-Snell $R^2=0.263$, Nagelkerke $R^2=0.297$) (Table 3).

Table 1. Demographic and clinical characteristics of participants (n=356)

Variables	n	%
Gender		
Female	218	61.24
Male	138	38.76
Age		
65-74	105	29.49
75-84	150	42.14
≥ 85	101	28.37
Level of dependence		
Independent	12	3.37
Semi-dependent	169	47.47
Bedridden	175	49.16
Caregiver of patient		
Offspring	199	55.89
Spouse	68	19.10
Other relatives	42	11.79
Paid caregiver	47	13.22
Chronic diseases		
Hypertension	250	70.22
Diabetes	124	34.83
Chronic renal disease	44	12.36
Cardiovascular disease	132	37.07
Chronic pulmonary disease	54	15.16
Oncological disease	34	9.55
Cerebrovascular disease	119	33.42
Dementia	125	35.11
Other diseases*	87	24.44
Pressure sore		
Present	72	20.22
Absent	284	79.78
Use of enteral nutrition supplement		
Present	58	16.29
Absent	298	83.71
MNA classification**		
Malnourished	98	27.52
At risk	152	42.69
Normal	106	29.79
BMI category***		
Underweight	5	1.40
Normal weight	170	47.76
Overweight	137	38.48
Obese	44	12.36

(Abbreviations: BMI, body mass index; MNA, Mini Nutritional Assessment.)

* Other diseases: Thyroid disease, epilepsy, Parkinson's disease, benign prostate disease, chronic rheumatic diseases, liver disease.

** MNA-SF classification: 0-7 = malnourished; 8-11 = at risk for malnutrition; 12-14 = normal nutritional status.

*** BMI category: <18.5 = underweight, 18.5-24.9 = normal weight, 25.0-29.9 = overweight, ≥30 = obese.

Table 2. Evaluation of demographic and clinical data of participants according to nutritional status

Variables	MNA classification*			P**
	Normal (n=106)	At risk (n=152)	Malnourished (n=98)	
Gender				
Female	73 (33.49%)	94 (43.11%)	51 (23.40%)	0.041
Male	33(23.91%)	58(42.02%)	47 (34.07%)	
Age				
65-74	36 (34.29%)	48 (45.71%)	21 (20.00%)	0.027
75-84	45 (30.00%)	63 (42.00%)	42(28.00%)	
≥ 85	25 (24.75%)	41 (40.60%)	35 (34.65%)	
Chronic diseases				
Hypertension	70 (28.00%)	108 (43.20%)	72 (28.80%)	0.489
Diabetes	39 (31.45%)	54 (43.55%)	31 (25.00%)	0.721
Chronic renal disease	18 (40.90%)	14 (31.83%)	12 (27.27%)	0.175
Cardiovascular disease	47 (35.60%)	48 (36.36%)	37 (28.04%)	0.112
Chronic pulmonary disease	15 (27.77%)	26 (48.14%)	13 (24.09%)	0.669
Oncological disease	3 (8.82%)	15 (44.18%)	16 (47.10%)	0.005
Cerebrovascular disease	26 (21.84%)	51 (42.86%)	42 (35.29%)	0.021
Dementia	17 (13.60%)	62 (49.60%)	46 (36.80%)	<0.001
Other diseases***	24 (27.58%)	44 (50.57%)	19 (21.83%)	0.201
Pressure sore				
Present	9 (12.50%)	28 (38.90%)	35 (48.60%)	<0.001
Absent	97 (34.15%)	124 (43.66%)	63 (22.19%)	
Level of dependence				
Independent	7 (58.33%)	4 (33.33%)	1 (8.34%)	<0.001
Semi-dependent	66 (39.05%)	78 (46.15%)	25 (14.80%)	
Bedridden	33 (18.85%)	70 (40.00%)	72 (41.15%)	
Caregiver of patient				
Offspring	61 (30.65%)	84 (42.21%)	54 (27.14%)	0.989
Spouse	21 (30.88%)	28 (41.18%)	19 (27.94%)	
Other relatives	10 (23.80%)	20 (47.62%)	12 (28.58%)	
Paid caregiver	14 (29.79%)	20 (42.55%)	13 (27.66%)	

* MNA-SF classification: 0-7 = malnourished; 8-11 = at risk for malnutrition; 12-14 = normal nutritional status.

**Pearson Chi-Square Tests

*** Other diseases: Thyroid disease, epilepsy, Parkinson's disease, benign prostate disease, chronic rheumatic diseases, liver disease.

Table 3. Logistic regression analysis of variables*

Variables	OR	95% CI	p
Gender	2.906	1.460-5.781	0.002
Age	0.524	0.236-1.163	0.112
Bedridden	0.309	0.154-0.619	0.001
Oncological disease	0.068	0.017-0.278	<0.001
Pressure sore	0.244	0.100-0.597	0.002
Cerebrovascular disease	0.341	0.170-0.683	0.002
Dementia	0.222	0.106-0.466	<0.001
Abbreviations: OR, Odds Ratio; CI, Confidence interval.			
* Cox-Snell R ² =0.263, Nagelkerke R ² =0.297			

Discussion

This cross-sectional study showed that malnutrition prevalence was high in patients (aged ≥65 years) who were registered to Home Care Services of Samsun Training and Research Hospital between January 1, 2022, and March 1, 2022. Of 356 subjects included, malnutrition was found in 27.52% and the risk of malnutrition in 42.69%. The malnutrition prevalence and risk of malnutrition were significantly higher in male subjects, in those aged ≥85 years, in those with oncologic disease, in those with cerebrovascular disease, in those with dementia, in the presence of pressure sore and in bedridden subjects.

In our study, it was found that malnutrition prevalence and risk of malnutrition were high in elder individuals receiving home care services, in agreement with the literature. In a study on patients receiving home care services, Tüzün et al. found malnutrition prevalence at 28.8% and risk of malnutrition at 36.3%.¹⁵ In a systematic review by Guigoz et al., it was found that malnutrition prevalence was 2% and risk of malnutrition was 24% in elder individuals (21 trials, n=14,149; range: 0-8% and 8-76%, respectively). These rates increased up to 9% and 45% in patients receiving home care services, respectively (25 trials, n=3,119; range: 0-30% and 8-65%, respectively).¹⁶ In a study by Cevik et al., it was found that there was malnutrition in 33.1% and risk of malnutrition in 39.3% of individuals aged ≥65 years who were receiving home care services.³ In the International SENECA study, the malnutrition prevalence was found to be 19-38% in healthy elderly individuals, 5-12% in elder individuals receiving home care services, 26-65% in hospitalized elderly individuals and 5-85% in those residing in nursing homes.¹⁷ Given the high prevalence of malnutrition, it can be suggested that in-home care services settings, early recognition of individuals at risk for malnutrition and timely management play important roles in the prevention of malnutrition and in the prognosis of related clinical conditions.

In our study, it was found that malnutrition prevalence was significantly higher in male gender. In the literature, there are contradictory results regarding malnutrition prevalence according to gender. In a study including patients receiving home care services, it was found that malnutrition frequency was higher in female subjects.¹⁸ However, there are studies indicating no significant difference in malnutrition prevalence according to gender.^{2,3,15} In our study, it was found that malnutrition prevalence was significantly higher in patients aged ≥ 85 years. In many studies, it was reported that malnutrition prevalence increased with advancing age^{19,20}; however, in some studies, no significant correlation was detected between malnutrition prevalence and age.^{3,15,18}

In our study, the presence of oncologic disease, cerebrovascular disease and dementia were found to be associated with malnutrition and risk of malnutrition. In cancer patients, weight loss occurs in 30-80% during the disease process. In these patients, malnutrition develops when food intake is decreased due to the tumor itself or complications or when metabolic demand is increased.²¹ In previous studies, it was reported that malnutrition and weight loss are poor prognostic factors in cancer patients.²² Cerebrovascular disease is an important neurological problem that may lead to dysphagia and swallowing disorders. In patients with cerebrovascular disease, malnutrition develops due to insufficient food and fluid intake. The food and fluid intake is decreased as a result of altered consciousness level in swallowing mechanism, physical weakness and coordination problems. In these patients, malnutrition is associated with poorer functional status and higher complication rates.²³ The malnutrition prevalence can increase up to 45% during the acute rehabilitation period following cerebrovascular disease.²⁴ In patients with dementia, decreased food intake and weight loss may occur due to impaired cognitive functions, alterations in the sense of smell and taste, neuroendocrine disorders, and dysphagia. In previous studies, dementia was linked to poor nutritional status.^{25,26} Yilmaz et al. found a significant correlation between dementia and malnutrition and reported that malnutrition prevalence was increased by increasing dementia symptoms.²⁷ Tüzün et al. found that the risk of malnutrition was high in patients with dementia, in agreement with our study.¹⁵

In our study, malnutrition prevalence was higher in bedridden subjects when compared to semi-dependent or non-dependent subjects. It was also found that the risk of malnutrition was increased in semi-dependent subjects. Previous studies reported that malnutrition prevalence and risk of malnutrition were increased in bedridden individuals.^{3,18,28} In a study on patients receiving home care services, malnutrition prevalence was found to be higher in bedridden patients, while the risk of malnutrition was in semi-dependent patients.¹⁵ In our study, it was found that malnutrition prevalence was significantly higher in subjects with pressure sores. Malnutrition is one of the major risk factors for the development of pressure sore. A low MNA score was reported as a potential predictor in the presence of a pressure sore.⁹ Weight loss and hypo-albuminemia due to inadequate food intake play a role in the development of pressure sore.²⁹ In the literature, it was reported that malnutrition prevalence is increased by the presence of pressure sore.^{18,30}

This study has some limitations. Since it is a single-center study, our results cannot be generalized to the general population. The study also has some strengths, including prospective design and inclusion of elderly individuals with physical and/or cognitive regression.

The malnutrition prevalence was higher among elder individuals receiving home care services. The risk of malnutrition was increased in male gender, in patients aged ≥ 85 years and in those with cerebrovascular disease and dementia. The malnutrition prevalence was found to be high in patients with oncologic disease, in the presence of pressure sore and in bedridden patients. In-home care settings, screening patients for malnutrition using appropriate tools and correction of nutritional status with appropriate interventions will positively affect general health status, quality of life and disease-related complications.

Ethical Considerations: Ethics committee approval was obtained with of Samsun University Samsun Training and Research Hospital Clinical Research Ethical Committee.

Conflict of Interest: The authors declare no conflict of interest.

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