EVALUATION OF DYSPHAGIA AND MALNUTRITION IN OLDER PATIENTS WITH STROKE

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ABSTRACT

Purpose: The study was aimed at investigating the dysphagia and malnutrition status in individuals with stroke and determining the relationship between the variables.
Material and Methods: The sample of this descriptive and analytical study consisted of 180 ≥65-year-old individuals with stroke who met the inclusion criteria, and who were treated in the neurology inpatient clinic of a state hospital. Data were collected using the Descriptive Information Form, Eating Assessment Tool-10, Bedside Water Swallowing Assessment Test, Mini Nutritional Assessment Form and Modified Barthel Index.
Results: The mean age of the participants was 74.40±6.87 years. According to the results of the Eating Assessment Tool-10 and Bedside Water Swallowing Assessment Test, approximately 73% of them experienced dysphagia. The mean score the participants obtained from the Mini Nutritional Assessment Form was 15.41±5.01, and 64.4% of them were diagnosed with malnutrition. There was a very high level of negative relationship between the scores the participants obtained from the Mini Nutritional Assessment Form, and the scores they obtained from the Eating Assessment Tool-10 (r=-0.806, p<0.001) and Bedside Water Swallowing Assessment Test (r=-0.815, p<0.001).
Conclusion: In the study, the swallowing and feeding behaviors of the participants who had a stroke were negatively affected.

Keywords: Stroke, older adult, dysphagia, malnutrition, nursing

INTRODUCTION

Stroke is a chronic disease that affects a great number of people both in Turkey and in the other countries of the world and has many negative effects on health. Stroke ranks first among the diseases that cause disability and workforce loss. It is reported that the prevalence of stroke in the world is more than 60 million, and it is estimated that approximately 16 million people are diagnosed with stroke every year (1-4). Since stroke is common, it is the leading cause of long-term disability in adults and adversely affects their independence levels while they perform activities of daily living. One of these activities is feeding behaviors (1,5).

Dysphagia is among the main reasons for changes in feeding in stroke patients. It is stated that dysphagia is observed in 42-67% of patients in the first three days after stroke, that 70% of them may recover after the first week, but that dysphagia continues for more than six months in 11-19% of them (6,7). If necessary precautions are not taken to identify and eliminate dysphagia, the patient may inevitably suffer from dehydration, aspiration pneumonia, and especially from malnutrition. Patients with stroke who do not

receive adequate nutrition due to dysphagia experience weight loss, a decrease in serum albumin value, deterioration in skin integrity, and retardation of healing (7,8). Thus, malnutrition worsens prognosis and increases mortality. Older patients who are dependent on others for nutrition have special nutritional needs due to dysphagia that occurs in the period following a stroke (9,10). In a study conducted with older patients who had a stroke, of the participants, 20.7% were diagnosed with dysphagia. Dysphagia continued after discharge in 50.9% of the participants diagnosed with dysphagia and 30.5% of them were fed through nasogastric tube (11).

Malnutrition is a serious health problem, especially for those in the geriatric age group. Delays in the diagnosis and treatment of malnutrition bring about negative consequences such as deterioration in general well-being, dependence on others in performing activities of daily living, tendency to infections due to suppression of immunity, increased risk of falls and fractures, pressure sores, anemia, deterioration in cognitive functions and even an increase in mortality (12-15). In addition, the duration and frequency of hospitalization increases in older patients with malnutrition (16,17). Therefore, early diagnosis and appropriate treatment of malnutrition is of great importance, especially in older patients (12,15).

Since nurses are health professionals who observe all the activities of daily living in the patient and interact with the patient for a long time, their monitoring the patient's feeding, identifying the factors affecting this activity, and being sensitive about malnutrition will ensure the early detection of possible complications (7). Although dysphagia and malnutrition are of great importance for patients with stroke because they pose a high risk of morbidity and mortality, screening is often neglected, which leads to delays in the diagnosis of malnutrition.

Therefore, it is important to evaluate the nutritional status of individuals with stroke and to address and analyses the risk factors related with malnutrition. Although studies on the evaluation of dysphagia and malnutrition in elderly patients with stroke are available in Turkey (7, 9, 18, 19), the number of such studies is not sufficient. In this context, this study is expected to contribute to the determination of dysphagia and malnutrition in stroke patients and to the planning of patient care. The present study was conducted to investigate the dysphagia and malnutrition status of individuals with stroke treated in the neurology inpatient clinic and to determine the relationship between the variables.

MATERIAL AND METHODS
Study Design and Participants
The population of this descriptive and analytical study consists of individuals with acute stroke who were treated in the neurology inpatient clinic of a state hospital between March 01, 2023 and August 31, 2023. In determining the minimum number of older adults with stroke to be included in the sample, power analysis was performed, and the minimum sample size to represent the universe was calculated as 172 people (significance level: 0.05, confidence interval: 1-α =0.95, margin of error: 0.20 and power: 1-β=0.80). Considering the possibility of withdrawals, or losses due to incorrectly or incompletely responded questionnaires during the study, it was decided to include more people in the sample. Thus, 180 people were included in the sample.

The inclusion criteria were as follows: being treated in the neurology inpatient clinic due to the diagnosis of ischemic stroke, being ≥65 years old, not having hearing impairment, being able to communicate verbally, having the cognitive ability to answer questions, and agreeing to participate in the study after being informed about the study. Individuals who had a previous stroke history, and who were diagnosed with hemorrhagic stroke were not included in the sample.

Measures and Procedure
Descriptive Information Form: The form prepared by the researchers in line with the literature consists of 15 items. Of the items, nine question the respondent's characteristics such as sex, age, marital status, educational status, etc., and six question the respondent's health behaviors and disease-related characteristics.

Eating Assessment Tool-10 (EAT-10) : The EAT-10 developed by Belafsky et al. (20) is used to assess symptoms and severity of dysphagia and the patient's response to treatment. The EAT-10 consists of 10 items. Responses given to each item are rated on a scale ranging from 0 to 4. The possible total score that can be obtained from the EAT-10 varies between 0 and 40. A score of ≥3 is considered as abnormal. Demir et al. (21) conducted the validity and reliability study of the Turkish version of the EAT-10.

Table 1. Sociodemographic characteristics of the participants (n=180)

Sociodemographic characteristics	n	%
Age [(mean±SD (min- max)]=[74.40±6.87 (65-92)]		
65-74 years	109	60.5
75-84 years	59	32.8
85-96 years	12	6.7
Sex		
Men	94	52.2
Women	86	47.8
Education level		
Illiterate	60	33.3
Literate but not a graduate of any school	87	48.3
Primary school	33	18.4
Marital status		
Married	108	60.0
Single	72	40.0
Employment status		
Employed	5	2.8
Unemployed	175	97.2
Social security		
Yes	169	93.9
No	11	6.1
Body Mass Index (BMI)		
Normal weight	53	29.4
Overweight	92	51.1
Obese	35	19.5
BMI [mean ±SS (min.- max.) (kg/m^2)]	27.01±3.63 (19.50-40.30)	

The Cronbach's Alpha coefficient of the EAT-10 was 0.90, 0.91 and 0.99 in Belafsky et al.'s study, Demir et al.'s study and the present study, respectively.

Bedside Water Swallowing Assessment Test (BWSAT): This test is a widely used method to evaluate swallowing function by having patients drink small amounts of water. While the patient drinks water, whether he or she can drink without hesitation, coughing, change in voice, whether water leaks from the corner of the mouth, or whether there is laryngeal movement is observed and whether there is a decrease in oxygen saturation is measured by using a pulse oximeter. Patients with 0-2 points are considered to have normal swallowing function, and patients with 3-6 points are considered to have dysphagia (22). In several studies, it has been reported that evaluating the test result together with oxygen saturation provides more accurate results. Therefore, it is recommended that while the BWSAT

is performed, oxygen saturation should be measured with a pulse oximeter (19).

Mini Nutritional Assessment (MNA) Form: The MNA form developed by Vellas et al. (23) is considered as a simple and reliable measurement tool to determine the nutritional status of people over the age of 65. The MNA Form contains 18 items grouped in the following 4 sections: anthropometric assessment (BMI, weight, arm and calf circumferences), general assessment (lifestyle, medication use, mobility, symptoms of depression and dementia), brief nutritional evaluation (number of meals, food and fluid intake, autonomy in nutrition) and subjective assessment (health and nutrition). The MNA Form is a rapid assessment tool which takes approximately 10-15 minutes to answer. While a score obtained from the overall form ranging between 24 and 30 indicates normal nutritional status, a score between 17 and 23.5 indicates risk of malnutrition, and a score below 17 indicates

malnutrition. The validity study of the Turkish version of the MNA form was conducted by Sarıkaya (24). The Cronbach's Alpha coefficient of the MNA form was 0.68 in Sarıkaya's study and 0.81 in the present study.

Modified Barthel Index (MBI): The MBI was developed by Barthel and Mahoney (25). Küçükdeveci and Yavuzer et al. performed the validity and reliability study of the Turkish version of the MBI (26). Its Cronbach's alpha value was 0.93 in Küçükdeveci and Yavuzer et al.'s study. MBI is one of the most commonly used scales for measuring activities of daily living such as fecal-urinary incontinence, feeding, washing hands and face, dressing, transfer, toilet use, mobility and bathing. Scores obtained from the overall MBI range from 0 to 100. While a score ranging between 0 and 20 indicates total dependence, a score ranging between 21 and 61 indicates severe dependence, a score ranging between 62 and 90 indicates moderate dependence, a score ranging between 91 and 99 indicates mild dependence and a score of 100 indicates independence. The Cronbach's alpha coefficient of the MBI was 0.79 in the present study.

The researcher asked the participants the questions in the data collection tools personally in their rooms and the patient or his/her relative answered them. Height and weight measurements for the MNA evaluation were performed with the measuring instrument available in the clinic. Calf and arm circumference measurements were performed with a tape measure. Arm circumference was measured by bending the arm 90° at the elbow and marking the midpoint between the acromion process on the shoulder and the olecranon process at the elbow. The height of the participants who could not get out of bed was measured in bed with a tape measure. For newly hospitalized patients, the last weight measured at home was taken into consideration. For other patients, the patient bed weighing system was used Body mass index (BMI) is calculated according to the World Health Organization (WHO) criteria, by dividing the body weight in kilograms by the square of the body height in meters.

Data Analysis

The study data were analyzed using the SPSS (Statistical Package for the Social Sciences) (ver: 22.0). Whether the data were normally distributed was determined by the Kolmogorov-Smirnov test. The t-test was used for independent groups. The ANOVA was used if there were more than two groups. In the study, Pearson Correlation Coefficient analysis was used to reveal the relationship between the variables. In the correlation analysis, 0-0.39 was accepted as weak relationship, 0.40-0.69 as moderate relationship, 0.70-0.89 as strong relationship, 0.90-1.00 as very strong relationship. In the analysis of the data, the significance level was accepted as $p < 0.05$.

Table 2. Participants' care status and disease-related characteristics (n=180)

Characteristics	n	%
Need for Assistance in Daily Care		
Yes	180	100.0
Presence of a Person Assisting in Daily Care		
Yes	171	95.0
No	9	5.0
People Assisting in Daily Care* (n=171)		
Children	83	48.5
Spouse	79	46.2
Nursing home staff	4	2.3
Relatives (uncle, aunt, etc.)	5	3.0
Duration of stroke disease		
1-4 days	51	28.3
5-8 days	75	41.7
9 days and more	54	30.0

*Percentages were calculated based on 171 elderly patients with stroke who reported having a daily care assistant

Table 3. Mean scores the participants obtained from the EAT-10, BWSAT, MNA Form, and MBI

SCALES (Ort±SS) (min-max)		
EAT-10 total (25.52±15.74) (0.00-40.00)		
Swallowing problems	**n**	**%**
Yes (abnormal swallowing)	132	73.3
No (normal swallowing)	48	26.7
BWSAT total (3.08±1.79) (0.00-6.00)		
Swallowing Function Status	**n**	**%**
There is dysphagia	130	72.2
Swallowing function is normal	50	27.8
MNA total (15.41±5.01) (4.00-25.40)		
Nutritional Status	**n**	**%**
Malnutrition	116	64.4
Situation at risk of malnutrition	57	31.7
Normal nutritional status	7	3.9
MBI total (27.50±25.31) (0.00-91.00)		
Dependency level	**n**	**%**
Fully dependent	93	51.7
Highly dependent	58	32.1
Moderately dependent	29	16.2

Abbreviation: EAT-10**:** Eating Assessment Tool-10, BWSAT: Bedside Water Swallowing Assessment Test, MNA: Mini Nutritional Assessment Form. MBI: Modified Barthel Index

Ethical Considerations

Before the study was started, ethics committee approval was obtained from *Sivas Cumhuriyet University, Non-invasive Clinical Research Ethics Committee (Approval date:* 18.01.23*; Number:*2023-01/39*)* and written permission from the hospital management where the study was to be conducted. During the data collection phase, all the individuals who agreed to participate in the study were informed about the study and their written consent was obtained. The principles of the Declaration of Helsinki were taken into account at every stage of the research.

RESULTS

The mean age of the participants was 74.40±6.87 years. Of them, 60.5% were in the age group of 65-74 years, 52.2% were men, 48.3% were literate, 60% were married, 97.2% were not employed and 93.9% had social security. According to their anthropometric measurements, the average Body Mass Index (BMI) score was calculated as 27.01±3.63 kg/m^2. Of them, 51.1% were overweight according to their BMI (Table 1).

In Table 2, the distribution of the care status and disease characteristics of the participants was given. All the participants needed help while doing their activities of daily living, and 95% of them needed help from someone with their care. Of the people who helped the participants with their care, 48.5% were their children and 46.2% were their spouses. The disease duration of 41.7% of participants is 5-8 days (Table 2).

The results of the scales used to determine the dysphagia, nutrition and dependency status of the participants were given in Table 3. The mean score the participants obtained from the EAT-10 was 25.52±15.74, and 73.3% of them had swallowing problems. The mean score they obtained from the BWSAT was 3.08±1.79, and 72.2% of them experienced dysphagia. The mean score they obtained from the MNA Form was 15.41±5.01. Of them, 64.4% suffered from malnutrition and 31.7% were at risk of malnutrition. The mean score they obtained from the MBI was 27.50±25.31, and 51.7% of them were fully dependent (Table 3).

In Table 4, the relationship between the mean scores the participants obtained from the MNA, EAT-10,

BWSAT and MBI was given. There were negative and very highly statistically significant relationship between the MNA scores, and the EAT-10 and BWSAT scores.

This finding indicates that as the participants' EAT-10 and BWSAT scores increased, in other words, as their difficulty in swallowing increased, their MNA scores decreased and their nutritional levels were negatively affected. However, there was a positive relationship between the participants' dependence levels and dysphagia levels. This finding indicates that patients with high level of dependency had more difficulty in swallowing (Table 4).

According to the comparison of the mean scores the participants obtained from the EAT-10, BWSAT Form and MNA form in terms of their sociodemographic characteristics, the variables such as age, education level, marital status and disease duration affected all scale scores. Accordingly, it can be said that the participants who were in the 86-96 age group, illiterate and/or single and whose stroke disease duration was 1-4 days had severer difficulty in swallowing according to the eating and drinking water test, and their nutritional scores were significantly worse (Table 5).

DISCUSSION

In patients with neurological disorders such as stroke, determining the factors affecting their nutritional status, monitoring their feeding behaviors and maintaining appropriate nutritional support are of great importance. The results of the present study indicate that more than half of the participants experienced dysphagia after stroke. In Abubakar and Jamoh's study (27) in which the presence of dysphagia in 94 patients with acute stroke was investigated, 34.4% of the participants had dysphagia. In Güçmen et al.'s study (9), dysphagia was observed in approximately 25% of the participants. In various studies, similar results were obtained (6,11). In the literature, it is reported that the prevalence of dysphagia after stroke ranges between 29% and 81% (28). This quite wide range shows that the result obtained in the present study is consistent with those in the literature.

Progressive dysfunction that develops due to neurological complications in older adults who have had a stroke is the main cause of nutritional deficiency, and the most serious of these deficiencies is dysphagia (14). Nurses play a key role in identifying and managing swallowing problems, and preventing complications that may develop due to difficulty swallowing (19, 29). In hospitalized patients, sometimes due to the short length of stay, the patient may be discharged before the healthcare team notices the early signs and symptoms of swallowing difficulty. Therefore, it is important to carry out careful monitoring of patients with appropriate measurement tools in order to prevent patients with dysphagia from being overlooked.

In the present study, the comparison of the mean scores the participants obtained from the EAT-10 and BWSAT in terms of their sociodemographic characteristics revealed that age led to a statistically significant difference in the frequency and severity of dysphagia. According to the results of the comparison, of the participants, those in the age group of 85-96 years experienced severer swallowing difficulties. In their study in which dysphagia and nutritional status of patients with stroke was investigated, Güçmen et al. (9) stated that older patients were at greater risk of dysphagia in the post-stroke period. In their study (30), Henke et al. evaluated dysphagia in patients in the acute phase of ischemic stroke and reported that age was a factor affecting dysphagia significantly.

Table 4. Relationship between the scores the participants obtained from the MNA Form, EAT-10, BWSAT, and MBI

Scales		1	2	3	4
1.MNA Total	r	-			
	p				
2.EAT-10 Total	r	-0.806	-		
	p	**0.000**			
3.BWSAT Total	r	-0.815	0.909	-	
	p	**0.000**	**0.000**		
4. MBI Total	r	0.81	-0.875	0.850	-
	p	**0.000**	**0.000**	**0.000**	

Abbreviation: 1.MNA: Mini Nutritional Assessment Form, 2. EAT-10**:** Eating Assessment Tool-10, 3. BWSAT: Bedside Water Swallowing Assessment Test, 4. MBI: Modified Barthel Index; r: Pearson correlation analysis

Table 5. Comparison of the mean scores the participants obtained from the EAT-10, BWSAT, MNA Form in terms of their sociodemographic characteristics

Variables	EAT-10	BWSAT	MNA
	Mean±SD	Mean±SD	Mean±SD
Age groups			
65-75 year	22.64±16.89	2.65±1.86	16.60±4.92
76-85 year	29.13±13.64	3.64±1.53	14.03±4.77
86-96 year	34.66±2.60	4.25±0.86	11.37±2.83
Test value	F=5.682	F=9.389	F=10.128
Significance level	**p=0.004**	**p=0.000**	**p=0.000**
Sex			
Men	24.71±16.08	2.91±1.85	15.20±5.22
Women	26.51±15.40	3.26±1.71	15.63±4.79
Test value	t=0.765	t=-1.320	t=-0.569
Significance level	p=0.445	p=0.253	p=0.570
Education level			
Illiterate	33.78±8.13	4.19±1.07	13.04±3.82
Literate	22.83±16.80	2.63±1.82	16.33±5.01
Primary school	17.34±17.22	2.18±1.80	17.39±5.43
Test value	F=16.353	F=23.259	F=11.944
Significance level	**p=0.000**	**p=0.000**	**p=0.000**
Marital status			
Married	23.46±16.39	2.63±1.77	16.34±4.99
Single	28.73±14.25	3.75±1.61	14.01±4.73
Test value	t=-2.225	t=-4.263	t=3.128
Significance level	**p=0.027**	**p=0.000**	**p=0.002**
Body Mass Index			
Normal weight	28.83±14.14	3.54±1.68	12.68±5.20
Overweight	23.84±16.29	2.85±1.81	16.60±4.55
Obese	25.17±16.23	2.97±1.82	16.40±4.34
Test value	F=1.711	F=2.608	F=12.535
Significance level	p=0.184	p=0.076	**p=0.000**
Duration of stroke disease			
1-4 days	17.70±17.77	2.23±1.98	18.05±4.83
5-8 days	25.21±15.59	2.92±1.68	15.99±4.50
≥9 days	33.50±8.71	4.11±1.17	12.10±4.00
Test value	F=15.348	F=17.647	F=24.484
Significance level	**p=0.000**	**p=0.000**	**p=0.000**

Abbreviation: F=ANOVA Analysis of Variance test value, t= T Test value in independent groups,
EAT-10**:** Eating Assessment Tool-10, BWSAT: Bedside Water Swallowing Assessment Test, MNA: Mini Nutritional Assessment Form, MBI: Modifiye Barthel Index

In the present study, another factor affecting the dysphagia process was the duration of the disease. Of the participants, those with a disease duration of 1-4 days experienced severer difficulty in swallowing. In the literature, it is reported that dysphagia is experienced intensely in the acute phase of the disease, but 70% of dysphagia can be resolved by the end of the first week (19, 14). In their study including 94 patients with acute stroke, Abubakar et al. (27) determined that the patients intensely experienced

dysphagia especially in the acute phase. However, in the literature, there are other studies indicating that there is no relationship between the level of dysphagia and the duration of stroke (9,14,31). The difference in the results obtained may have stemmed from the disease-related characteristics of the samples and the differences between the measurement tools used.

Another parameter investigated in the present study is the nutritional status of the participants. The Mini Nutritional Assessment Form was used to determine the nutritional levels of the participants, which demonstrated that 64.4% of them were malnourished and that 31.7% were at risk of malnutrition. It is stated that approximately 90% of patients with stroke are at risk of malnutrition (32) and the prevalence of malnutrition reaches up to 45% in the acute period (14). In the literature, results regarding this issue vary from one study to another. It has been reported that the rate of malnutrition diagnosed during hospital admission in patients with acute stroke ranges between 3.8% and 32%, that this rate reaches 7.5-35% at the end of the second week of hospitalization, and that the rate of malnutrition development approximately doubles within two weeks after the stroke (22, 33). In Çoban's study conducted with patients with stroke, malnutrition was detected in 66.1% of the participants in the age group of ≥65 years and in 12.2% of the participants in the age group of <65 years (34). In Mollaoğlu et al.' study in which 123 patients with a diagnosis of stroke were treated, according to the results of the MNA, 22.8% of the participants developed malnutrition and 50.4% were at risk of malnutrition (18). In a study conducted with 1650 patients over the age of 65 in Australia and New Zealand, according to the result of the subjective global assessment test, 60% of the participants were malnourished (35).

Although results vary from one study to another, it can be said that post-stroke malnutrition is a serious problem and affects many patients. In the literature, it is stated that mortality rates are higher in the first week following the stroke in patients whose nutritional status deteriorates after stroke, that patients' hospitalization durations increase due to complications and that their prognosis worsens, and the importance of monitoring nutrition in patients with stroke is emphasized (22, 33).

In the present study, according to the results of the comparison of the participants' sociodemographic characteristics and their mean score for the MNA, the variables such as age, educational status, marital status and disease duration led to a statistically significant difference on their malnutrition status, but the sex variable had no effect on their malnutrition status. Of the participants, those who were illiterate, who were in the age group of 85-96 years, who were single and whose disease duration was 1-4 days obtained significantly lower scores from the MNA. Several researchers state that as the level of education increases, so does the socioeconomic status of patients, which provides them with the opportunity to reach better nutritional conditions. In their study conducted to determine the malnutrition status in older people with stroke aged ≥65 years, Cin et al. (14) stated that there was a statistically significant relationship between the participants' education level and MNA scores. In her study conducted to determine the effect of post-stroke swallowing monitoring and training on swallowing function and complications related to difficulty swallowing, Savcı obtained similar results (19).

In the present study, the marital status variable led to a statistically significant difference in the prevalence of malnutrition and the mean scores they obtained from the MNA was high. This data can be explained by the fact that the regular eating habits of the single participants were not good enough in the pre-stroke period and that whether they were caregivers or not. In her study conducted to determine the malnutrition status of patients admitted to the neurological rehabilitation unit after stroke, Rüstemova Bayraktar observed that the marital status of patients with stroke did not make a significant difference on the presence and frequency of malnutrition (36).

In the present study, there were negative and very high-level statistically significant relationships between the MNA scores, and the EAT-10 and BWSAT scores. This finding indicates that as the EAT-10 and BWSAT scores of the participants increased, in other words, as their difficulty in swallowing increased, their MNA scores decreased and their nutritional levels were negatively affected. In the present study, it was also determined that there was a relationship between dependency level and malnutrition level. The level of malnutrition was higher in dependent patients. In Vanderwee et al.'s study conducted in Belgium (37), of the 2329 older patients included in the sample, 71% with difficulty swallowing suffered from malnutrition. In a study conducted in Turkey, nutrition of patients with stroke who had difficulty swallowing was affected and their risk of

malnutrition increased (14). Güçmen et al. (9) report that malnutrition develops when dysphagia is not controlled in patients who lose weight due to dysphagia. Of the 1662 patients included in Carrion et al.'s study, while 47.4% suffered from dysphagia, 30.6% suffered from malnutrition. Both conditions were associated with poor functional capacity (38). This finding supports the relationship between the malnutrition, dysphagia and dependency level obtained in the present study. Luo et al. (39) reported that of the patients with moderate and severe malnutrition, most were older patients with dysphagia and low albumin. In the same study, it was also determined that the nutritional risk level increased in patients with decreased functional independence. Acute decreased food and fluid intake associated with dysphagia is a contributing factor to increased malnutrition in subsequent processes (9). Dysphagia not only is a stroke-induced complication but also is a care problem that negatively affects patients' oral nutrition. Researchers report that malnutrition is an independent risk factor for dysphagia. In the present study, as in other studies in the literature, it was determined that patients with dysphagia were at a greater risk of malnutrition.

CONCLUSION

In the present study, most of the participants suffered from dysphagia-induced malnutrition. Poorly managed dysphagia may lead to the development of complications such as aspiration, dehydration, malnutrition, prolonged hospital stay, or readmission. Therefore, evaluation of the patient's swallowing function upon admission to the hospital, and planning and implementing individualized care including early precautions in the presence of dysphagia are of importance, because such interventions will prevent not only the development of malnutrition but also all possible complications (19).

In line with this result, it is recommended that the swallowing skills and feeding activities of older patients who have experienced stroke should be routinely evaluated with appropriate measurement tools, and that their feeding activities should be supported with individual nutrition programs. It is also recommended that multicenter studies with larger sample groups including high-risk older individuals should be conducted in order to generalize the results.

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