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Research Article

Evaluation of the nutritional status of patients hospitalized in palliative care and its relationship with depression

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ABSTRACT

Objective: This study aims to assess the nutritional condition of patients hospitalized in palliative care and to determine the connection between their nutritional status, depression, and daily living activities.

Methods: This cross-sectional and descriptive study, carried out between November 20, 2023, and April 2024, questionnaires including sociodemographic characteristics, Mini Nutritional Assessment (MNA), Geriatric Depression Scale (GDS), and Barthel Index of Activities of Daily Living were administered to patients hospitalized in the Palliative Care Unit of Ordu University Training and Research Hospital. The data were analyzed using IBM SPSS V23, with a significance level set at $p<0.05$.

Results: A total of 169 individuals were included in the study. The average age of the participants was 81.26±8.96 years, with ages ranging from 65 to 100 years. The average score on the Mini Nutritional Assessment (MNA) scale was 16.77, and the average score on the Geriatric Depression Scale-Short Form (GDS-SF) was 7.08. The average score for the Barthel Index of Activities of Daily Living was 45.86. When examining the relationships between the Barthel Index and GDS-SF scores, Barthel Index and MNA scores, as well as MNA and GDS-SF scores, a statistically significant correlation was found (for all; $p<0.001$). As MNA scores decreased, GDS-SF scores increased, while Barthel Index scores decreased.

Conclusion: Patients in need of palliative care often face difficulties in meeting their own needs and tend to be dependent on their surroundings, with a predisposition to malnutrition and depression. A strong interrelationship exists between these three conditions. In our study, it was observed that as patients' susceptibility to malnutrition increased, their tendency towards depression also heightened, which in turn led to a parallel increase in their level of dependency. In line with the findings of our study, a thorough evaluation of both nutritional status and depression in every patient during clinical practice will not only improve patients' quality of life but also facilitate a quicker response to treatment and enhance overall health outcomes. Although our study has certain limitations, the similarities among these clinical conditions suggest that interpreting the results as a whole may serve as a critical strategy to enhance treatment success in palliative care and support improved patient follow-up and survival.

Keywords: Family practice, dependency, nutrition, depression, activities of daily living, palliative care

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Introduction

Palliative care is a multidisciplinary speciality which focuses on improving the standard of living of patients with incurable diseases. [1] Malnutrition is defined as a condition that reduces the patient's physical and mental functions and deteriorates the clinic as a result of a change in body composition due to inadequate intake or utilisation of nutrients. [2,3] Loss of physical strength due to nutritional deficiency can trigger depression by causing psychological weaknesses such as anxiety and sleep disorders.[4]

In a study, it was stated that depression findings in elderly individuals were associated with lower physical activity levels, and an inverse relationship was observed between mobility and depression, and it was recommended to be physically active to reduce the risk of depression.[5] In 2019, Keskin et al. examined the relationship between the risk of malnutrition and activities of daily living in geriatric patients, revealing that those with restrictions in daily activities had higher malnutrition rates.[6]

In our clinical experience, we found that the majority of patients described by their relatives as 'restless' had depressive moods. Additionally, the high level of concern expressed by the relatives of patients with poor nutrition, along with studies in the literature on nutrition and depression in the geriatric population, led us to the conclusion that similar studies should be conducted for palliative care patients as well. Therefore, we designed our study with the hypothesis that there might be a positive correlation between the MNA, GDS-SF, and Barthel indices, which are valid and reliable scales routinely applied to our patients in palliative care services. If such a correlation is found, identifying the need for variability in treatment modalities could potentially improve individuals' quality of life. Thus, by contributing to the early recognition and treatment of malnutrition and depression, this approach will support the improvement of the quality of life for both patients and their relatives.

Materials and Methods

The study was carried out over a 5 and a half month period between 20 November 2023 and April 2024 following the approval of the ethics committee. The sample size was calculated using the OpenEpi program. Accordingly, with a 95% confidence interval, a 5% margin of error, and a 95% confidence level, the minimum required sample size was determined to be 161 participants. In this study, it was aimed to reach approximately 200 individuals. The study included 169 volunteer individuals who consented to participate in the study after the patients hospitalised in the Palliative Service of Ordu University Training and Research Hospital were informed about the study.

The inclusion criteria for the study were being hospitalized in the palliative care unit, volunteering to participate in the study, and having no health condition preventing the completion of the questionnaire. The exclusion criteria were not being a patient in the palliative care unit, refusing to participate in the study, and having a health condition that prevented completing the questionnaire.

For this research, approval was granted by the Ordu University Faculty of Medicine Clinical Research Ethics Committee, as per the ethics committee decision dated 10.11.2023 and numbered 2023/287. After obtaining the necessary permissions, data collection began with participants who agreed to take part in the study. The questionnaire, administered through face-to-face interviews, included questions on participants' sociodemographic characteristics and utilized the MNA, GDS-SF, and Barthel scales.

The MNA was created in 1994 through a collaboration between the University of Toulouse, New Mexico Medical School and the Swiss Nestle Research Centre. For the first time, it was validated in three separate studies with the participation of more than 600 elderly people in total and these studies were published by Guigoz et al. in 1996.[7] A validation study for the Turkish population was conducted by Sarıkaya.[8] MNA includes 18 questions gathered in 4 sections. These four sections consist of questions regarding general health status, nutrition, anthropometric measurements and patient's self-assessment. The scale has a maximum score of 30 and a minimum score of 0. According to the score intervals; ≥24 is considered as normal nutritional status, 17-23.5 is considered as at risk of malnutrition and <17 is considered as malnutrition.[7]

The GDS-SF Scale was developed by Yesavage et al. in 1983.[9] The Turkish validity and reliability study was conducted by Durmaz in 2018.[10] The scale comprises 15 questions that require yes or no responses. When scoring, 1 point is assigned for each response indicating depression, while 0 points are given for other answers. According to the score ranges the scale is interpreted as follows: no depression for scores between 0-4, mild depression for scores between 5-8, moderate depression for scores between 9-11, and severe depression for scores between 12-15. The scale has a minimum score of 0 and a maximum score of 15.

The Barthel Activities of Daily Living Index was created by Dorothy Mahoney in 1965 and its Turkish validity and reliability were conducted by Yavuzer in 1996.[11] This scale includes 10 questions, with scores ranging from 0 to 15 points in 5-point increments, depending on the specific question. According to the score ranges, the scale is interpreted as follows: 0-20 indicates full dependence, 21-61 indicates high dependence, 62-90 indicates moderate dependence, 91-99 indicates mild dependence, and a score of 100 indicates full independence. The maximum score on the scale is 100, and the minimum score is 0.

The data were analyzed using IBM SPSS Version 23. The normality of distribution was assessed using the Kolmogorov-Smirnov and Shapiro-Wilk tests. Associations between categorical variables were examined using the Chi-square test, Yates' correction, Fisher's Exact test, and Fisher-Freeman-Halton test. The Mann-Whitney U test was used to compare non-normally distributed variables between two groups, while the Kruskal-Wallis test was used for comparisons among three or more groups, followed by the Dunn test for post-hoc multiple comparisons. Spearman's rho correlation coefficient was used to examine the relationship between non-normally distributed variables. Spearman correlation analysis was applied to assess the relationships between continuous variables that were ordinal or not normally distributed. Results were presented as mean±standard deviation and median (minimum–maximum) for quantitative data, and as frequency (percentage) for categorical data. A p-value of <0.050 was considered statistically significant.

Results

A total of 169 participants took part in the study, with an average age of 81.26±8.96 years (ranging from 65 to 100). The majority of the participants were female (n=96, %56.8).

Among the participants, 98 had a Body Mass Index (BMI) of 23 or above. According to the MNA scoring, 78 individuals were classified as malnourished. Based on the GDS-SF, 109 individuals were identified as having a depressive mood. A total of 64 participants were fully dependent in terms of care. Descriptive statistics regarding BMI categories, and the scores of the MNA, GDS-SF, and Barthel Index are presented in Table 1.

Table 1. Descriptive statistics of BMI classes, MNA, GDS-SF and Barthel scales

	Frequency (n) / Mean±SD	Percentage (%) / Median (Min. - Max.)
MNA Total Score	16.77±7.26	18 (1 - 30)
GDS-SF Total Score	7.08±4.20	7 (0 - 15)
Barthel Total Score	45.86±38.28	45 (0 - 100)
BMI		
BMI less than 19	19	11.2
BMI between 19 and 21	23	13.6
BMI between 21 and 23	29	17.2
BMI 23 and above	98	58
MNA Score		
Normal nutritional status	35	20.7
At risk of malnutrition	56	33.1
Malnourished	78	46.2
GDS-SF Score		
No depression	60	35.5
Mild depression	45	26.6
Moderate depression	28	16.6
Severe depression	36	21.3
GDS-SF (Depression is absent or present)		
No	60	35.5
Yes	109	64.5
Barthel Index Score		
Fully dependent	64	37.9
Highly dependent	43	25.4
Moderately dependent	25	14.8
Mildly dependent	7	4.1
Fully independent	30	17.8

Table 2. Examining the relationship between depression levels and degree of dependence

Barthel Index	No depression (n, %)	Mild depression (n, %)	Modarete depression (n, %)	Severe depression (n, %)	Total (n, %)	Test Statistic	p
Fully dependent	10 (16.7)	10 (22.2)	19 (67.9)	25 (69.4)	64 (37.9)		
Highly dependent	9 (15)	23 (51.1)	6 (21.4)	5 (13.9)	43 (25.4)		
Moderately dependent	14 (23.3)	6 (13.3)	1 (3.6)	4 (11.1)	25 (14.8)	60.629	< **0.001**[z]
Mildly dependent	6 (10)	0 (0)	0 (0)	1 (2.8)	7 (4.1)		
Fully independent	21 (35)	6 (13.3)	2 (7.1)	1 (2.8)	30 (17.8)		

[z]Fisher's Exact Test with Monte Carlo Correction; n (%)
Accordingly, as the severity of depression increased, the dependency status increased (p<0.001).

According to Barthel index, there was statistical significance between dependency status and depression level. Accordingly, as the severity of depression increased, the dependency status increased (p<0.001). The relationship between depression levels and dependency degree is presented in Table 2.

Individuals without depressive mood were most commonly in the normal nutritional status category, while almost all individuals with severe depression were malnourished. According to the MNA index, there was a statistically significant relationship between nutritional status and depression level (p<0.001). The relationship between depression levels and nutritional status is presented in Table 3.

The median total MNA score values differ according to the GDS-SF factor (p<0.001). The comparison of MNA average scores according to depression status is presented in Table 4. A statistically significant difference was found in the median total GDS-SF scores according to the MNA categories (p<0.001). The comparison of GDS-SF average scores with the presence of malnutrition is presented in Table 5.

According to the Barthel index, there was statistical significance between the nutritional level in fully dependent people. Accordingly, the dependency status increased as the severity of malnutrition increased. (p<0.001) The relationship between the presence of malnutrition and the levels of dependency is presented in Table 6.

According to the Spearman correlation test, a statistically significant relationship was found between the total scores of GDS-SF, Barthel, and MNA (for all, p<0.001). A negative correlation was observed between the MNA and GDS-SF scores. The results of the correlation analysis between the scale scores are presented in Table 7.

Table 3. The examination of the relationship between depression levels and nutritional status

	No depression (n, %)	Mild depression (n, %)	Modarete depression (n, %)	Severe depression (n, %)	Total (n, %)	Test statistics	p
MNA Score							
Normal nutritional status	26 (43.3)	6 (13.3)	1 (3.6)	2 (5.6)	35 (20.7)	63.756	**<0.001**[x]
At risk of malnutrition	24 (40)	22 (48.9)	7 (25)	3 (8.3)	56 (33.1)		
Malnourished	10 (16.7)	17 (37.8)	20 (71.4)	31 (86.1)	78 (46.2)		

[x]Pearson's chi-square test n (%)

Table 4. The comparison of average MNA scores based on depression status

	Mean±SD	Hydrangea (min. - max.)	Test Statistics	p
GDS-SF				
No depression	21.492±4.97	23 (8 - 30)	5114.500	**<0.001**[x]
Yes depression	14.22±7.041	15 (1 - 29)		

[x]Mann Whitney U Test; Median (minimum-maximum)

Table 5. The comparison of average GDS-SF scores with the presence of malnutrition

	Mean±SS	Hydrangea (min. - max.)	Test Statistics	p
MNA Score				
Normal nutritional status	3.941±3.402	3 (0 - 15)a	50.925	**<0.001**[x]
At risk of malnutrition	5.696±3.324	5.5 (1 - 14)a		
Malnourished	9.462±3.734	10 (1 - 15)b		

[x]Kruskal Wallis H Test; ^(a-b) there is no difference between groups with the same letter. Median (minimum-maximum)

Table 6. The examination of the relationship between the presence of malnutrition and the levels of dependency

	Normal nutritional status (n, %)	At risk of malnutrition (n, %)	Malnourished (n, %)	Total (n, %)	Test Statistics	p
Barthel Index						
Fully dependent	1 (2.9)	9 (16.1)	54 (69.2)	64 (37.9)	82.057	< **0.001**[z]
Highly dependent	7 (20)	20 (35.7)	16 (20.5)	43 (25.4)		
Moderately dependent	9 (25.7)	11 (19.6)	5 (6.4)	25 (14.8)		
Mildly dependent	4 (11.4)	2 (3.6)	1 (1.3)	7 (4.1)		
Fully independent	14 (40)	14 (25)	2 (2.6)	30 (17.8)		

[z]Fisher's Exact Test with Monte Carlo Correction; n (%)
Accordingly, as the severity of malnutrition increased, the level of full dependency also increased (p<0.001).

Table 7. Correlation analysis results between scale scores

	MNA Total Score		GDS-SF Total Score	
	r^x	p	r^x	p
GDS-SF Total Score	-0.614	< **0.001**		
Barthel Total Score	0.677	< **0.001**	-0.583	< **0.001**

[x]Spearman's rho correlation

While the median total MNA and GDS-SF scores did not differ according to gender, the median total Barthel scores showed a significant difference based on gender (p=0.005).

Discussion

Malnutrition is a significant clinical condition linked to higher rates of mortality and morbidity. Although it can be seen in all age groups, older adults are more susceptible to malnutrition due to various psychological, physiological, and social risk factors.[12] In Sarıkaya's study, it was determined that 15.0% of the elderly who underwent MNA were malnourished and 29.9% were at risk for malnutrition.[8]

In the literature, malnutrition is very high in palliative care patients. In Bekar's study evaluating the nutritional status of patients admitted to Home Health Care (HHC), 61.86% were malnourished, 31.16% were at risk of malnutrition, and 6.9% were in normal nutritional status.[13] According to the study conducted by Akan et al. in HHC, it was determined that 48.3% of 89 elderly people over the age of 65 were malnourished, 38.2% were at risk of malnutrition and 13.5% were in normal nutritional status.[14] Both HHC and palliative are units where individuals' care processes begin. We can attribute this to reasons such as individuals being dependent on the environment, not being able to reach adequate food intake, being exposed to loss of appetite due to many chronic diseases or psychological factors such as loneliness and depression.

Ranhoff et al. evaluated the nutritional status of 69 older individuals with MNA-SF and found that 30.0% of the older adults were malnourished and 74.0% were at risk for malnutrition and the mean MNA-SF score was 7.8±2.9.[15] Slee et al. found that the mean MNA-SF scores of hospitalised malnourished and at risk for malnutrition were 6.9±2.9 and 8.9±2.2, respectively[16]; Lilamand et al. found 9.8±2.4 in the elderly in nursing homes.[17] In our study, the mean MNA-SF scores of the elderly were found to be 16.77±7.26, which was higher than the studies in the literature.

The fact that elderly individuals in Türkiye live in a large family structure and have easier access to care services thanks to family support; at the same time, the fact that patients can have a regular and balanced diet thanks to the foods prepared at home by caregivers contributes to the adequate nutritional intake of elderly individuals.

Considering the studies evaluating the nutritional status of palliative care patients, malnutrition is frequently seen in palliative care patients both in our study and in most studies. Increased dependency level of palliative care patients, physical and psychosocial problems due to aging, impaired eating skills or difficulties in accessing food are considered among the causes of malnutrition. It is important to evaluate palliative care patients in terms of malnutrition at the time of hospitalisation and to establish a nutritional care plan in addition to medical treatment.

Depression is frequently seen in the elderly and is associated with morbidity. This condition leads to a decline in functionality, lowers the quality of life, and increases the risk of suicide among patients in palliative care.[18] In Yıldız's study on elderly individuals, Madeira et al.'s study on the elderly in Portugal, Şahin's study in Edirne and another study conducted in Bahrain with 517 participants, it was found that the participants had mild depression according to the depression score similar to our study.[19-22]

In the study conducted by Efendioğlu in a palliative care centre, 79.4% of the patients had a GDS-15 score of 5 or more.[23] Palliative care patients usually have serious and progressive diseases. Depression is more common due to reasons such as patients having to cope with symptoms such as constant pain, fatigue, nutrition and sleep problems, realising that they are approaching the end of their lives, withdrawing from their social environment, and becoming more dependent on daily life activities.

The rate of dependency is higher in patients hospitalised in palliative services due to their high age, having multiple chronic diseases and having a history of cerebrovascular disease. In our study, the mean Barthel score was 45.86±38.28. 37.9% of the patients were fully dependent, 25.4% were severely dependent and 14.8% were moderately dependent. In the study by Güdük et al. in patients receiving home health care services, 37% were identified as fully dependent, 20% were found to be severely dependent and 8% were found to be moderately dependent, and results close to our study were obtained.[24] In the study by Tüzün et al. Conducted with the patients they followed in HHC, they concluded that 32.8% were fully dependent.[25] In the study of Çatak et al. on individuals aged 65 and older registered in the home health unit, 27.8% of the patients were found to be fully dependent on the bed.[26]

In the study by Velázquez-Alva et al., the mean Barthel score was found to be 65.0± 35.0 and 20.6% were fully dependent, 19.2% were highly dependent, 25.2% were moderately dependent and 25.6% were fully independent.[4] Although dependency is considered to be a natural process of old age, it varies in studies depending on the average age of the patients and the accompanying chronic diseases. Therefore, closely monitoring the health status of bedridden individuals is crucial, provide access to appropriate treatment and rehabilitation programmes and provide support to improve the quality of their lives.

An inverse relationship between mobilisation and depression is known. It is recommended to be physically active to reduce the likelihood of depression or to treat it. In a study conducted in low-income countries, Vancampfort et al. reported that elderly people with depressive symptoms were less physically active.[5] Veronese et al. reported that the risk of depression is higher in the elderly who are not physically active and that physical activity has a determining effect

on depression.[27] In the research carry out by Velázquez-Alva et al. in elderly individuals, the BI score of people without depression was found to be 73.1 on average, and 52.3 in those with mild and severe depression.[4] In our study, we see that those without depression are more fully independent, while the rate of dependency increases as the severity of depression increases. Depression is characterised by symptoms such as low energy and withdrawal from life in general. This condition reduces the mobility of individuals by limiting their physical activities.

Poor nutrition of hospitalised geriatric patients increases the risk of depression, complicates the treatment of depression and other diseases, prolongs the length of hospital stay and reduces the quality of life of individuals.[28] For these reasons, early identification and management of malnutrition in geriatric patients is very important. Physical weakness caused by malnutrition in the elderly can cause various diseases, sleep disorders, anxiety and trigger depression and psychological sensitivity.[4] In our study, the mean depression score of those with normal nutritional status was 3.9±3.4, The average depression score malnourished patients was 9.462±3.734. As depression severity increased, the risk of malnutrition also increased. In a study carried out geriatric patients in Bangladesh, the median depression score of patients with normal nutritional status was 6.5, those at risk of malnutrition were 8.4, and those with malnutrition were 11.4.[29]

Keshavarzi et al. reported that both depression and malnutrition were common in geriatric population. In the study, GDS-SF scores of malnourished elderly people were found to be higher than normal ones, and a significantly worse nutritional status was found in individuals with depressive symptoms. It has also been reported that depressive symptoms and nutritional deficiencies have an adverse effect on quality of life.[30]

In the study conducted by Efendioğlu in a palliative care centre, it was found that most of the patients were malnourished and depressive symptom scores were high, and a relationship between the two conditions was found.[23] In the study conducted by Cansel and colleagues in geriatric patients, depression scores of those with malnutrition and malnutrition risk were found to be higher than adequate nutrition status, and a positive relationship was shown between malnutrition severity and depressive symptoms.[31] The relationship between depression and malnutrition is interactive. Examining the relationship between these factors is of significant importance such as nutrition and depression among patients hospitalised in palliative services, both in terms of improving the quality of life of patients and improving clinical approaches.

The connection between nutrition, depression symptom scores, and activities of daily living reinforces the idea that both depression and malnutrition can lead to functional loss. A study in Portugal revealed a correlation between MNA score, low appetite, depression, and addiction, while another study found a significant link between physical dependence and malnutrition.[20]

In a cross-sectional study involving elderly individuals living in the community complete physical dependence was found to have a strong association with malnutrition.[32] In addition, in a cross-sectional study on home care service recipients in Türkiye, a positive relationship was found between the Barthel Index and MNA scores, and as a result of multiple regression analysis; BI remained significant even after adjusting for depression, dementia, and anthropometric values.[33] In a cross-sectional study in China, full

physical functional dependence was found to have a strong association with malnutrition.[32]

According to our findings, consistent with the literature. it was concluded that the rate and severity of dependency increased as the susceptibility to malnutrition increased. Malnourished elderly individuals were found to have a significantly higher bed dependency status compared to those at risk for malnutrition and those with normal nutritional status. Malnutrition, depression and addiction form a vicious cycle that triggers and reinforces each other in elderly individuals. Malnutrition weakens the physical strength and general health of the individual, which limits mobility and leads to dependence.

Depression exacerbates malnutrition by negatively affecting eating habits through loss of appetite and lack of motivation. Dependency, on the other hand, exacerbates depression and worsens the health status of the individual through factors such as social isolation and physical inactivity. As a result, these three factors are closely interrelated and lead to worsening health outcomes in older people. Our duty as family physicians is to approach patients in a holistic manner from a biopsychosocial perspective, to evaluate patients before hospitalisation with appropriate screening methods and to provide the most appropriate treatment for patients and their relatives in line with the data we obtain.

Limitations of the study

The limitations of our study include the fact that it was conducted with patients from the palliative care unit of Ordu University Training and Research Hospital, designed as a cross-sectional study, and the absence of multivariate analyses for comorbidities. However, these limitations highlight the importance of our study in serving as a reference for larger-scale and multi-center research in the future.

Ethical approval

This study has been approved by the Ordu University Faculty of Medicine Clinical Research Ethics Committee (approval date 10.11.2023, number 2023/287). Written informed consent was obtained from the participants.

Author contribution

Study conception and design: NE, BÇA; data collection: NE; analysis and interpretation of results: NE; Draft manuscript preparation: NE, BÇA. All authors reviewed the results and approved the final version of the article.

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Conflict of interest

The authors declare that there is no conflict of interest.

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