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## Malnutrition in Elderly Staying in Nursing Homes

### ABSTRACT

**Aim:** The aim of this study was to assess the prevalence of malnutrition of elderly people in living either public or private nursing home.

**Methods:** The sample of this descriptive study was 308 elderly, who were living in public and private homes for the elderly in Ankara. Data were collected by using an interview form, the Mini-Nutritional Assessment (MNA), the Standardized Mini-Mental Test (SMMT), and the Barthel index.

**Result:** 28.6% of the elderly staying in the nursing home suffered from malnutrition and 44.5% of them were at risk for malnutrition. Furthermore, 27.3% of participants were found to have sensory losses, 53.6% had gastrointestinal problems, and 40% had deficiencies in their oral and dental health. Those suffering from gastrointestinal problems have a lower mean nutritional score (MNA) ( $p<0.05$ ).

**Conclusion:** Results of this study demonstrated a higher incidence of malnutrition among the elderly people receiving care in public or private nursing homes

**Keywords:** Elderly, Malnutrition, Nursing Home, Nutrition.

## Huzurevinde Kalan Yaşlılarda Malnutrisyon

### ÖZET

**Amaç:** Bu çalışmanın amacı, kamu ya da özel huzurevinde yaşayan yaşlıların malnutrisyon prevalansını değerlendirmektir.

**Yöntem:** Tanımlayıcı olarak yapılan çalışmada örneklemini Ankara ilinde bulunan özel ve devlet huzurevlerinde kalan 308 yaşlı birey oluşturmaktadır. Veriler anket formu, Mini Nutrisyonel Değerlendirme (MND), Standardize Mini Mental Test (SMMT) ve Bartel İndeksi (Bİ) kullanılarak toplanmıştır.

**Bulgular:** Çalışma sonucunda, huzurevlerinde kalan yaşlılarda malnutrisyon oranı %28.6, malnutrisyon riski oranı ise %44.5 bulundu. Ayrıca yaşlıların %27.3'ünde duyu kayıpları, %53.6'sında gastrointestinal sorunlar ve %40'ında ağız ve diş sağlığı sorunları saptanmıştır. Gastrointestinal sorunu olana yaşlıların beslenme skorları (MNA) düşük çıkmıştır ( $p<0.05$ ).

**Sonuç:** Bu çalışmanın sonucunda özel ve devlet huzurevinde kalan yaşlılarda malnutrisyon oranının oldukça yüksek olduğu saptanmıştır.

**Anahtar Kelimeler:** Beslenme, Huzur Evi, Malnutrisyon, Yaşlı.

## INTRODUCTION

Malnutrition is more commonly seen among the elderly (1,2). The prevalence of malnutrition is considerably higher (25-49%) of elderly people in the world (1-5). The prevalence of malnutrition risk was 28-53.6% and malnutrition frequency was 8-15.9% among elderly people in Turkey (6-11). It is a problem experienced by all elderly living in their own house or staying in a care-giving institution such as a nursing home or hospital that is significant, common, and often late diagnosed. Elderly face a higher risk of malnutrition because of physical and physiological changes associated with aging (12,13). The most fundamental cause of malnutrition is insufficient nutrient consumption. The second is the increase in the need for nutrients due to fever, infection, or catabolic disorders. Common physiological problems that affect the nutritional status of elderly are sensory loss, poor mouth and dental health, decreased appetite, chewing problems and dependency on help for eating. Among the psychological factors leading to malnutrition are depression, dementia, alcoholism, and loss of beloved individuals. The literature showed that the social factors are poverty, living alone, social isolation, lack of social support, lack of ethnic food supply for those who live in care-giving institutions, inability to buy or prepare foods, and inability to feed oneself (14-16).

Malnutrition has negative effects on many functions of the body. These include cardiovascular, renal, respiratory, gastrointestinal, immunity-related, and mental effects. Because of all these effects, untreated malnutrition leads to a higher rate of morbidity and mortality among the elderly (17,18). Determining malnutrition and malnutrition risk at early stages enables taking precautions and initiating appropriate nutritional support on time. By this way the rate of complications of malnutrition can be reduced. And nurses play the role of health care professional in evaluating the nutritional status of elderly staying in a nursing home. In this study, we evaluated nutritional status for malnutrition of elderly staying in either public or private nursing home.

## MATERIAL AND METHODS

**Setting and sample:** This is a descriptive study that aims to examine the risk factors associated with nutrition and malnutrition among the elderly individuals staying in nursing homes. The population of this research was 1554 elderly individuals and above staying in a public elderly care institution or a private nursing home, and the sample consisted of 308 individuals who are living seven nursing home (accepting research) from the population. Using stratified random sampling, 56% of the sample (173 individuals) was selected from public care-giving institutions, while 44% (135

individuals) were selected from private nursing homes.

The exclusion criteria were: 1- staying temporarily or living in the institution for <3 months, 2- receiving supplements or tube feeding 3- being in a terminal condition of health, 4- not accepting to take part in this survey.

**Instruments:** The nutritional status of participants was assessed using the “*Mini Nutritional Assessment*” test (MNA), their cognitive status was assessed using the “*Standardized Mini-Mental State Test*” (SMMT), and “*Mini-Mental State Test for the Uneducated*” (SMMT-E), and their functional health status was assessed using the “*Modified Barthel Index*”.

The MNA full form test consists of 18 items structured in 4 parts: anthropometric assessment (weight loss, body mass index, mid-arm circumference and calf circumference), global assessment (mobility, prescription drugs, independent life, psychological stress or acute disease, pressure sores or skin ulcers and neuropsychological problems), dietary assessment (full meals eaten daily, food intake decline, fluid consumption, protein intake, fruit and vegetable intake and mode of feeding) and self-assessment (self-view of nutritional status and self-view of health status) (19).

SMMT, Molloy and Standish (1997) created a standardized version of the Mini-Mental State Examination (MMSE) developed by Folstein et al. (1975) (20,21). The test is commonly used especially to assess the cognitive status of elderly individuals. The reliability and validity test of the Turkish version of the scale was conducted by Gungen et al. (2002) (22).

The Modified Barthel Index developed by Mahoney and Barthel (1965) helps evaluate the dependency status of individuals on help for taking care of themselves (23). The validity and reliability test of the Turkish version of the scale was performed by Yavuzer et al. (2000) (24). This instrument aims to evaluate the capacity of individuals to perform the activities of daily living (such as eating, going to the restroom, taking a bath, dressing up, getting around indoors, and getting around outdoors) without any help from others.

**Data collection procedure:** The “Interview Form” which consisted of questions addressing descriptive characteristics and medical, socioeconomic, and psychological status of participants were filled in by examining the patient files in these institutions as well as through face-to-face interviews conducted with the participants. Under nutrition was defined as a body mass index <18.5. Anthropometric parameters (arm circumference, waist circumference and triceps

skinfold thickness) were measured, and information was gathered on nutritional habits.

**Anthropometric measurements:** The researcher performed all anthropometric measurements and interviews necessary for the assessment of nutritional status after take course related to anthropometric measurements. Weight was recorded to the nearest kilograms (kg). Height in meters (m) was estimated from the demi-span (distance from the tip of middle finger to midline of the sternum) of all residents 20.

**Ethical consideration:** Official permission was obtained from care-giving institutions prior to the study. The researchers also obtained the approval of the Hacettepe University Ethics Committee (*Issue: 886 Decree No: LUT 09/1-30*). An oral consent was obtained from participants after informing them about the research.

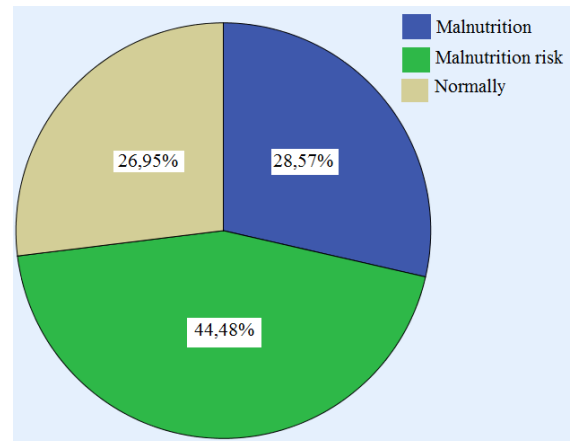
**Statistical analysis:** The data collected from participants were statistically analyzed using SPSS 15 software package (Statistical Package for Social Sciences). Descriptive analyses were presented using means and standart deviations. The relationship between the nutritional status of elderly individuals and independent variables were analyzed using the t-test, chi-square, regression analysis, and correlation test. P values <0,05 value were accepted statistically significant in tests used.

## RESULTS

According to result, malnutrition risk was determined in 44.5% and malnutrition was determined in 28.57% of the participants according to MNA assessment (Figure 1). It was found that 58% were female; the mean±SD age of the participants was 78.70±7.87 years (Table 1). Female participants were found to have a lower mean MNA score than males. A negative relationship with a strength of 24.2% was found between MNA scores and age, that is, MNA scores went down as age increased.

It was found that 53% of participants had a GIS-related problem (n=165).The most commonly seen problems were loss of appetite (51.5%), constipation (43.4%), dyspepsia (31.5%), and difficulty chewing (28.4%). Those who were suffering from loss of appetite, dysphagia, vomiting, and difficulty chewing had a lower mean nutritional score than those who did not suffer from these gastrointestinal problems (p<0.05) (Table 2).

It was found that 40% of elderly individuals staying in nursing homes had a mouth health-related problem. Those who had a mouth health-related problem had a lower mean nutritional score than those who did not (p<0.05) (Table 2). Those who lacked teeth (70,8%), had dentures or denture-related problems(31,4%) and those who suffered from dry mouth (34,9%) had a lower mean nutritional score than those who did not have these problems (p<0.05) (Table 2).



**Figure 1.** The nutritional status of the participants.

According to Barthel index, 25.3% of participants were fully independent, while 22,7% were moderately dependent, 21,7% were severe dependent and 19,4% were completely dependent (Table 2). Those who were independent in their activities of daily living had a higher mean MNA score than those who were dependent. The scores received from the MNA test and the Barthel Index was found to be positively correlated with strength of 53.3%. It was also found that the nutritional scores increased as the level of independence in daily activities increased. 53.5% of participants did not have a cognitive impairment, while 17,2% had mild cognitive impairment, and 13,3% had a severe cognitive impairment. The difference between the mean MNA scores according to the cognitive health status of participants were found to be statistically significant (p<0.05) (table 2). Those whose cognitive status was normal according to their Standardized Mini-Mental Test score had a higher mean MNA score than those who had cognitive inefficiency. A positive correlation with a strength of 51.7% was identified between cognitive health status and MNA score. One's MNA score increased as their cognitive health status got better (Table 2).

Variables affecting nutritional status (socio-demographic characteristics, and variables concerning medical, socio-economic, and psychological status) were added to a multiple regression model (Table 3). The total effect of these independent variables on nutritional status as the dependent variable (MNA score) was investigated. Using the Stepwise Regression Technique, the variables that were not significant were gradually eliminated in order to find the ones that were statistically significant. According to the results of this regression analysis, the following independent variables were found to have an effect on MNA scores: use of medication, the presence of GIS-related problems, dysphagia, reluctance about joining in social activities, cognitive inefficiency, dependency in the activities of daily living, and lack of interest in food.

**Table 1.** Socio-demographic characteristics of individuals according to groups (n=308).

Future of Personal		Malnutrition (n=83)	Risk of Malnutrition (n=137)	Normal (n=88)	p
<b>Age</b> (n=308)		80.7 ± 8,2	78.8 ± 7,3	76.4 ± 7,5	<b>0.001</b>
<b>Gender</b>	Female (n=179, 58%)	59 (33,0%)	86 (48,0%)	34 (19,0%)	<b>0.002</b>
	Male (n=129, 42%)	29 (22,5 %)	51 (39,5%)	49 (38,0%)	
<b>Education status</b>	Illiterate (n=86, 28%)	22 (25,6%)	38 (44,2%)	26 (30,2%)	<b>0.497</b>
	Literate (n= 38, 12%)	9 (23,7%)	15 (39,5%)	14 (36,8%)	
	Elementary school (n=90, 29%)	30 (33,3%)	36 (40,0%)	24 (26,7%)	
	Junior high school (n=23, 8%)	5 (21,7%)	13 (56,5%)	5 (21,7%)	
	High school (n=40, 13%)	13 (32,5%)	21 (52,5%)	6 (15,0%)	
	University (n=31, 10%)	9 (29,0%)	14 (45,2%)	8 (25,8%)	
<b>Civil status</b>	Single (n=72, 23%)	19 (26,4%)	34 (47,2%)	19 (26,4%)	<b>0.063</b>
	Married (n=45, 15%)	9 (20,0%)	19 (42,2%)	17 (37,8%)	
	Widow (n=191, 62%)	60 (31,4%)	84 (44,0%)	47 (24,6%)	
<b>The frequency of contact with relatives</b>	Frequent (n=136, 44%)	36 (26,5%)	59 (43,4%)	41 (30,1%)	<b>0.608</b>
	Rare (n=73, 24%)	17 (23,3%)	35 (47,9%)	21 (28,8%)	
	Never (n=53, 17%)	19 (35,8%)	25 (47,2%)	9 (17,0%)	
	No relatives (n=46, 15%)	16 (34,8%)	18 (39,1%)	12 (26,1%)	

**Table 2.** Medical conditions of individuals according to groups (n=308).

Features		Malnutrition (n=83) (mean ± SD)	Risk of malnutrition (n=137) (mean ± SD)	Normal (n=88) (mean ± SD)	p
<b>MMSE scores (0-30)</b> (cognitive impairment)					
<b>0-9</b> (Severe) [(n:41/13,3%), (14,7±4,6) ]					
<b>10-19</b> (Moderate) [(n:49/15,9%), (17,3±4,2)]		15,8± 9,1	22,1± 7,3	26,5± 4,1	<b>0.000</b>
<b>20-23</b> (Mild) [(n:53/17,2%), (19,7±4,6)]					
<b>24-30</b> (No) [(n:165/53,5%), (22,0±4,4) ]					
<b>Barthel index scores</b>					
<b>0-20</b> (Complete dependent) [(n:60/19,4%), (15,3±5,7) ]					
<b>21-61</b> (Severe dependent) [(n:67/21,7%), (18,4±4,2) ]		37,8± 37,2	69,5± 30,4	85,5± 25,1	<b>0.000</b>
<b>62-90</b> (Moderate dependent) (n:71/22,7%), (21,5±3,59) ]					
<b>91-99</b> (Mild dependent) [(n:32/10,3%), (22,0±3,9) ]					
<b>100</b> (Normal) [(n:78/25,3%), (22,3±4,6) ]					
<b>Regular taking drugs</b> (n= 269)		4,1± 2,3	4,0± 2,6	3,1 ± 2,8	<b>0.026</b>
<b>Acute Disease</b>	<i>Present</i> (n=35, 11%)	16 (45,7%)	11 (31,4%)	8 (22,9%)	<b>0.055</b>
	<i>Absent</i> (n=273, 89%)	72 (26,4%)	126 (46,2%)	75 (27,5%)	
<b>Chronic Disease</b>	<i>Present</i> (n=272, 88%)	81 (29,8%)	122 (44,9%)	69 (25,4%)	0.070
	<i>Absent</i> (n=36, 12%)	7 (19,4%)	15 (41,7%)	14 (38,9%)	
<b>Sensory loss</b>	<i>Present</i> (n=84, 27%)	31 (36,9%)	27 (32,1%)	26 (31,0%)	<b>0.001</b>
<b>Digestive problems</b>	<i>Appetite</i> (51,5%) <i>Constipation</i> (43,4%) <i>Dyspepsia</i> (31,5%) <i>Difficulty chewing</i> (28,4%)	<i>Present</i> (n=165, 53%)	58 (35,2%)	68 (41,2%)	<b>0.001</b>
		<i>Absent</i> (n=143, 46%)	30 (21,0%)	69 (48,3%)	
<b>Oral health of problem</b>	<i>Lacked teeth</i> (70,8%) <i>Dentures problem</i> (31,4%)	<i>Present</i> (n=124, 40%)	66 (32,0%)	90 (43,7%)	<b>0.032</b>
	<i>Dry mouth</i> (34,9%) <i>Mucositis</i> (13,1%)	<i>Absent</i> (n=84, 60%)	22 (21,6%)	47 (46,1%)	

**Table 3.** The results of multiple regression analysis of the MNA score of risk factors on the effect nutritional status.

The risk factors	B	Std. Error	t	p	%95 CI
Status of Drug Use	1.948	0.619	3.147	=0.002	0,73 - 3,16
Problems of digestive	1.390	0.433	3.213	=0.001	0,54 - 2,24
Difficulty in Swallowing	2.684	0.752	3.568	<0.000	1,21 - 4,16
Participation in Social Activities	-0.553	0.267	-2.074	=0.039	-1,08 - -0,03
Reduction of the interest to food	3.901	0.579	6.732	<0.000	2,77 - 5,04
The score of MNA	0.179	0.029	6.101	<0.000	0,12 - 0,24
The score of Barthel Index	0.036	0.007	5.328	<0.000	0,02 - 0,05
<b>R<sup>2</sup>=0.545; F=51.250</b>				<b>&lt;0.05</b>	

## DISCUSSION

In Turkey, some studies have been performed in these settings: It was found the malnutrition risk and malnutrition incidence to be 31-71% and 8-15.9% respectively (6-11). In our study, according to the MNA scores received on the Mini Nutritional Assessment test, participants had a malnutrition risk of 44,48% and a malnutrition incidence of 28.6. We think that early diagnosis of elderly individuals with malnutrition risk is very important as it increases the likelihood of a timely intervention and helps prevent possible future complications.

Various studies on elderly individuals living in nursing homes or in the society identify gender as a dependent risk factor for malnutrition (7,26). In harmony with these previous studies, our study identified being female as a risk factor for malnutrition.

Gastrointestinal problems can be seen among elderly just like any other age group, and they bear special importance because of their relationship with nutrition. Our study found that participants who had a gastrointestinal problem had a lower mean MNA score than those who did not have one. Participants who suffered from a gastrointestinal problem such as loss of appetite, dysphagia, vomiting, and difficulty chewing had a lower mean nutritional score than those who did not. Many studies indicate a strong relationship between mouth health and malnutrition (27,28). Participants who had a mouth health problem associated with lack of teeth, dry mouth, or dentures had a lower mean nutrition score than those who did not.

**Other Factors Affecting Nutritional Status; Dependency in ADLs and Cognitive Health Status:** Many studies indicate a strong relationship between dependency in the activities of

daily life and mean MNA scores (10,12,26-29). Our study suggested that participants who were dependent in the activities of daily living according to their Barthel Index score had a lower mean MNA score than those who were independent. Nutrition score also goes down as a dependency in the activities of daily living goes up. Our study suggested that participants who had a normal cognitive status according to the Standardized Mini-Mental Test had a higher mean MNA score than those who had a cognitive problem. MNA score goes up as cognitive health status increases. Studies focusing on the relationship between cognitive status and nutritional status show that the individuals suffering from cognitive problems bear a greater malnutrition risk than individuals who do not have any cognitive problems (16,29).

In conclusion, according to our study, among elderly individuals, those who were female, those who had an acute and chronic illness, those who were on medication, those who were suffering from sensory loss, those who had gastrointestinal problems, and those who had a mouth health issue had a higher incidence of malnutrition. Being dependent in the activities of daily living and having a cognitive problem were found to be a risk factor for malnutrition. It is necessary that the elderly individuals be scanned for their nutritional status and associated risk factors when they are first admitted to care-giving institutions. Individuals suffering from a nutritional problem should be given proper dietary support.

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**Declaration of interest:** The authors declare that there is no conflict of interest.

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