

ORIGINAL RESEARCH

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Nutritional status of elderly people living in nursing home and some related factors**Recep Bentli¹, Nese Karakas², Betul Firinci³, Serdar Deniz⁴**¹Inonu University, Faculty of Medicine, Department of Internal Medicine, Malatya, Turkey²Inonu University, Vocational School of Health Services, Department of Health Care Services, Malatya, Turkey³Inonu University, Faculty of Medicine, Department of Public Health, Malatya, Turkey⁴Malatya Provincial Directorate of Health, Malatya, Turkey

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Abstract

The aim of this research is to evaluate the nutritional status of elderly people residing in a nursing home and to examine the relationship of the results with chronic diseases. The sampling of the descriptive and cross-sectional research consists of 65 nursing home residents. The data of the research were collected through the Personal Information Form, Mini Nutritional Assessment Test (MNA), Hand Grip Strength Test, Activities of Daily Living Scale and Geriatric Depression Scale. In the analysis of the data, $p < 0.05$ value was accepted as statistically significant. The mean MNA score of the participants was calculated as 22.24 ± 4.8 ; malnutrition was found in 15.4% and malnutrition risk was detected in 41.5%. There was a statistically significant positive relationship between the MNA scores and hand grip strengths of the participants ($r = 0.299$, $p < 0.05$). Low hand grip strength was discovered in 52.3% of the participants. There was no significant difference among the distribution of MNA scores according to the chronic diseases of the participants ($p > 0.05$). MNA scores of the participants who had depression were found to be significantly low ($p < 0.05$). As the dependency level in the activities of daily living increased, hand grip strength ($r = -0.362$, $p < 0.01$) and MNA scores ($r = -0.596$, $p < 0.01$) decreased significantly.

Keywords: Malnutrition, nutrition, nursing home, elderly people**Introduction**

Demographic aging is the decrease in the rate of children and young people in the total population and the increase in the rate of elderly population [1]. Turkey is one of the countries that experience the most rapid demographic aging process. In Turkey, the rate of the people over 65 was specified as 8.5% in 2017. According to population projections, this rate is expected to reach 10.2% in 2023 and 22.6% in 2060 [2]. The main topic coming to the forefront in the increase in the expected length of life after birth and the increase in the rate of elderly people in the society is healthy aging, i.e., the quality of aging. The factors effective in the quality of aging are healthy eating, physical activity, being a non-smoker, regular physical activity, and control of chronic diseases [3].

The deficiency, excesses or imbalances in energy and/or food intake are defined as malnutrition [4,5]. Although malnutrition affects every age group, it is more complicated in elderly people than young people. The studies conducted reveal that malnutrition reduces the quality of life in the elderly; and it is

the determinant of morbidity and mortality [6,7]. The presence of comorbidity in elderly people, level of functional dependency, bereavement of spouse, low level of education were associated with malnutrition [8,9]. Early diagnosis and effective treatment of malnutrition can prevent potential morbidity and mortality [10].

The most frequently used screening tool for the screening of malnutrition in elderly people is the Mini Nutritional Assessment Test. In addition, since muscle function is affected by malnutrition in early period, it is recommended that hand grip strength should be used as an early diagnostic tool in the determination of malnutrition risk [10-12].

The aim of this study is to evaluate the nutritional status of people living in Malatya Nursing Home and to analyze the relationship between the results and chronic diseases.

Material and Methods

The research was conducted in descriptive and cross-sectional type in Malatya Nursing Home between 01-15 November 2018. The universe of the research consists of the elderly people ($n = 80$) residing in Malatya Nursing Home on the dates when the research was conducted. The research aims to reach the whole universe without using any sampling method. 65 (81.0%) nursing home

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residents who accepted to participate in the research were included in the research.

Data collection tools

The data of the research were collected through the Personal Information Form, Mini Nutritional Assessment Test, Hand Grip Strength Test, Activities of Daily Living Scale and Geriatric Depression Scale.

Mini Nutritional Assessment Test (MNA): MNA test consists of 18 questions as 15 verbal and 3 anthropometric measurements. The first section of the MNA test consists of 6 questions, and those receiving a score of 11 and below out of 14 scores are considered as risky groups in terms of malnutrition and they continue to the second section of the test with 12 questions. The total MNA score between 23.5-30.0 is accepted as normal nutritional status, a score between 17.0-23.0 is accepted as malnutrition risk, and a score lower than 17.0 is accepted as malnutrition [11,12]. The Turkish validity and reliability of the test was performed by Sarıkaya [13].

Hand Grip Strength Measurement Test: Hand grip strength measurement of the participants was performed by Jamar Hydraulic Hand Dynamometer. The hand grip strength of the participants was determined by calculating the mean of the values by measuring three times from the dominant hand. In this research, <20 kg in females and <30 kg in males were accepted as low hand grip strength in line with the literature [14,15].

Activities of Daily Living Scale (ADL): It is a 9-item scale that questions the functions of dressing, eating, toilet, transfer, personal hygiene, bed movement, locomotion and continence. Each item is evaluated through 3 points (0= independent, 1= controlled, 2= assisted, 3= dependent). It is accepted that the functional capacity decreases as the score increases in the ADL scale [16,17].

Geriatric Depression Scale (GDS): It was developed by Yesavage et al. in 1983 for the depression scanning of the elderly population. In terms of its ease of use, Burke et al. proved the validity and reliability of the 15-item short form [18,19]. The Turkish validity and reliability of the test was performed by Ertan et al. [20]. In this research, the short form of GDS was used and the scores above 5 were accepted as depression risk.

Statistical assessment of the data

SPSS 21.0 (Statistical Package for Social Sciences) was used for the analysis of the data obtained. The research data did not exhibit a normal distribution according to the Kolmogorov-Smirnov test, and they were not homogenous in respect to Levene's test ($p < 0.05$). The Man-Whitney U test and the Kruskal-Wallis test were used for discovering the difference between the groups in the independent samplings. The Tamhane test was used to specify between which groups there was a significant difference in more than two independent samplings. The Spearman Correlation coefficient was used in the analysis of the continuous variables. The chi-square test was used for the assessment of the categorical data. $p < 0.05$ was considered statistically significant.

Research ethics

The ethics committee approval was received from the Non-Interventional Research Ethics Committee of İnönü University before beginning the research (2018/12-12). A written permission

was taken from Malatya Provincial Directorate of Family and Social Policies in order to conduct the research in Malatya Nursing Home.

Results

The age means of the nursing home residents in the research were 77.4 ± 8.7 and 60% of them were 85 years old and above. 52.3% of the participants were women, 52.3% were divorced or their spouse had died, and 40% were illiterate.

Participants' MNA score means were 22.24 ± 4.8 ; malnutrition was observed in 15.4% and the risk of malnutrition in 41.5% (Figure 1).

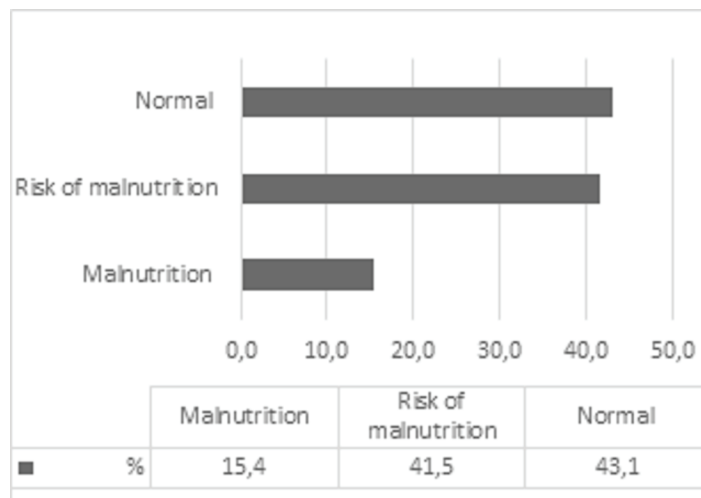


Figure 1. Distribution of Nutritional Status by MNA Scores

The mean hand grip strength of the nursing home residents in the research was found as 21.08 ± 11.09 . Low hand grip strength was discovered in 52.3% of the participants. As seen in Figure 2, there is a statistically significant positive relationship between the MNA scores and the hand grip strengths of the participants ($r = 0.299$, $p < 0.05$).

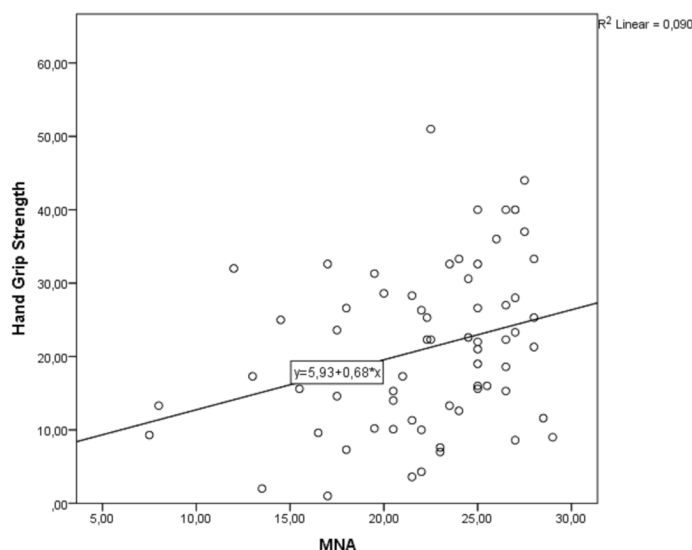


Figure 2. Relationship Between Hand Grip Strength and MNA Scores

children and smoking ($p>0.05$), the distribution of their MNA scores differed according to their condition of doing physical activities; the group which created difference was the one who went walking regularly ($p<0.05$).

		n	%	Median	Min.- Max.	Statistical values	
Gender						z	p
	Female	34	52.3	24.50	12.00-29.00	-1.348	0.178
	Male	31	47.7	22.00	7.50-28.50		
Age						KW	p
	60-74 years	6	9.2	24.75	17.00-26.50		
	75-84 years	20	30.8	21.50	7.50-29.00	3.732	0.155
	85 years and above	39	60.0	24.50	13.00-28.00		
Educational Background						KW	p
	Illiterate	26	40.0	22.15	7.50-28.50		
	Primary School	30	46.2	23.75	13.50-29.00	2.103	0.349
	Secondary school and above	9	13.8	25.00	19.50-27.00		
Marital Status						KW	p
	Single	20	30.8	23.05	14.50-24.50		
	Married	11	16.9	27.20	7.50-28.00	2.103	0.349
	Other	34	52.3	34.73	8.00-29.00		
Smoking						KW	p
	Yes	14	21.5	24.50	16.50-27.50	3.864	0.144
	No	36	55.4	21.50	8.00-29.00		
	I quit	15	23.1	25.00	7.50-28.00		
						KW	p
	* Regular walking	25	38.5	35.04	13.00-28.50		
	Occasionally walking	28	43.1	37.23	8.00-29.00	8.417	0.015
	No walking	12	18.5	18.88	7.50-26.50		

When we categorized the nursing home residents in the research as to their levels of executing activities of daily living, 76.9% were independent, 13.8% were completely dependent. The relationship between the dependency levels, nutritional status and hand grip strengths of the nursing home residents is given in Table 5. As the dependency level in the activities of daily living increased, hand grip strength ($r=-362$, $p<0.01$) and MNA scores ($r=-596$, $p<0.01$) decreased significantly.

Table 2. Comparison of MNA scores according to chronic diseases of nursing home residents

		n	%	Median	Min.- Max.	z	p
Hypertension	Yes	33	50.8	22.30	13.50-29.00	-0.47	0.636
	No	32	49.2	23.75	7.50-28.00		
Osteoarthritis	Yes	17	26.2	21.50	12.00-29.00	-0.62	0.325
	No	48	73.8	22.35	7.50-28.50		
Diabetes	Yes	14	21.5	23.65	15.50-28.00	-0.47	0.482
	No	51	78.5	23.00	7.50-29.00		
COPD	Yes	12	18.5	23.00	7.50-29.00	-1.21	0.226
	No	53	81.5	24.50	17.50-28.00		
Dementia	Yes	8	12.3	18.50	12.00-27.00	-1.97	0.048
	No	57	87.7	23.50	7.50-29.00		
Depression	Yes	7	11.9	18.00	8.00-25.00	-2.27	0.023
		52	88.1	24.50	7.50-29.00		

Z=Mann-Whitney U Test

Table 3. Distribution of Hand Grip Strengths according to gender of nursing home residents

		Low Hand Grip Strength		Normal Hand Grip Strength		X ²	p
		n	%	n	%		
Gender	Female	8	23.5	26	76.5	23.667	<0.001
	Male	26	83.9	5	16.1		

Table 4. Comparison of hand grip strengths according to chronic diseases of nursing home residents

		n	%	Median	Min-Max	z	p
Hypertension	Yes	35	50.8	17.30	2.00-40.00	-2.198	0.028
	No	30	49.2	24.30	1.00-41.00		
Osteoarthritis	Yes	17	26.2	15.30	3.60-32.00	-1.1911	0.560
	No	48	73.8	24.45	1.00-51.00		
Diabetes	Yes	14	21.5	19.80	4.30-40.0	-0.056	0.955
	No	51	78.5	21.30	1.00-41.00		
COPD	Yes	12	18.5	15.30	4.30-44.00	-1.133	0.257
	No	53	81.5	22.00	1.00-41.00		
Dementia	Yes	8	12.3	15.45	1.00-32.00	-1.108	0.268
	No	57	87.7	22.00	2.00-51.00		
Depression	Yes	7	11.9	22.50	3.60-41.00	-2.223	0.824
		52	88.1	17.30	7.30-32.60		

Z=Mann-Whitney U Test

Table 5. The Relationship between ADL Scale Total Score and MNA Scores and Hand Grip Strengths

		MNA	Hand Grip Strength
ADL scale total score	r	-.569	-.362
	p	0.000	0.003

Discussion

Malnutrition is an important public problem observed more frequently in elderly people compared to the general population [4,5]. Whereas the malnutrition and malnutrition risk ratio is stated as 5-15% in the general population, this ratio is reported to be 10-

38% in elderly people living in the society and increase up to 85% in elderly people at hospital or nursing homes when it comes to old population [22]. Küçük and Kapucu stated the malnutrition ratio as 28.6% and the malnutrition risk ratio as 44.5% in elderly people who stayed in nursing homes; it was revealed in a study conducted in India that 70% of the old population was under the malnutrition risk and malnutrition was observed in 19.5% [23,24]. In our study, the MNA score means of the nursing home residents are 22.24±4.84; malnutrition was encountered in 15.4% of the participants and the malnutrition risk in 41.5%.

Sarcopenia is defined as “the loss of skeletal muscle mass and strength occurring with the increasing age” [25]. The hand grip strength is suggested to be used as an early diagnostic tool in

malnutrition because the muscle function is affected by inadequate nutrition at an early time [14,15]. In our study, the hand grip strengths of the nursing home residents increased as their MNA scores increased ($r=0.299$, $p<0.05$). Saka et al. reported in their study on nursing home residents that the malnutrition ratio was higher in the nursing home residents who were thought to be sarcopenic according to the hand grip strength measurements ($p<0.001$) [11]. Demir referred to a statistically significant relationship between the hand grip strength and the MNA in his study conducted on the patients above 60 years of age who were staying at hospital ($p<0.001$) [26].

No statistically significant relationships were discovered between the ages of the participants and the MNA scores in this study ($p>0.05$). However, as the ages of the participants in the research increased, their hand grip strengths decreased ($r=-0.253$, $p<0.05$). It was stated in the literature that the hand grip strength decreased with the age [27,28]. The MNA score distributions of the nursing home residents in the research did not differ according to the participants' characteristics of gender, marital status, education and smoking ($p>0.05$). While Maderia et al. revealed that the malnutrition/malnutrition risk in women was higher than men ($p<0.05$), no significant difference was reported between the genders in the studies conducted in Turkey ($p>0.05$) [29,30]. Dişçigil and Sökmen state that the low hand grip strength is higher in women [31]. Contrary to the literature, the low hand grip strength ratio was higher in male participants in our study ($X^2=23.667$, $p<0.01$).

MNA score distribution of the nursing home residents in the research differed as to their levels of doing physical activities and the group which created difference was the one who went walking regularly ($p<0.05$). Similarly, Slavíková et al. referred to a positive relationship between physical activity and MNA scores in their study [32].

It is stated in the study conducted by Ongan in 25 nursing homes of Turkey that the chronic diseases mostly observed in the nursing home residents were hypertension (60.3%), cardiovascular disease (34.3%), rheumatic diseases (29.8%) and diabetes (29.4%) [20]. It was reported that the nursing home residents in this research had mostly hypertension (50.8%), osteoarthritis (26.2%), diabetes (21.5%) and COPD (18.5%). Ayraller et al. stated that the malnutrition and malnutrition risk distribution was not statistically significant according to the presence of chronic diseases ($p>0.05$), however, the malnutrition and malnutrition risk ratio was higher in participants with hypertension [33]. In this research, no significant difference was discovered between the chronic diseases and the MNA score distributions of the nursing home residents ($p>0.05$), but the nursing home residents with hypertension had lower hand grip strengths ($p<0.05$).

In this study, depression was found in 11.9% of the participants according to the GDS. While the MNA score means of the group with the diagnosis of depression were statistically and significantly low ($p<0.05$), no statistically significant difference was discovered between the hand grip strength means ($p>0.05$). Saka et al. reported in their study that they observed depression in 15.7% of the nursing home residents and found no significant relationship between depression and malnutrition/malnutrition risk in participants ($p>0.05$) [11]. Balci et al. state in their study

conducted on elderly people who lived with their families that 7.9% of the participants had depressive complaints. Moreover, it was reported in the same study that the depression score (towards depression) increased as the MNA score decreased (malnutrition) [34]. Contrary to our study, it is stated in some studies that the hand grip strength is lower in elderly people with depression or anxiety disorder compared to the control group [35-37].

It is reported in the literature that malnutrition leads to direct or indirect decrease in the activities of daily living and people who are dependent in executing the activities of daily living have a higher malnutrition risk [38,39]. 13.8% of the nursing home residents in this research were completely dependent in executing the activities of daily living and the hand grip strength ($r=-362$, $p<0.01$) and the MNA scores ($r=-596$, $p<0.01$) significantly decreased as the dependency level of the participants in the activities of daily living increased.

Conclusion

Consequently, the malnutrition ratio found in the nursing home residents in the research is similar to the one in the studies conducted on the nursing homes of our country. As the MNA score of the participants diminished, the hand grip strength decreased. As the functional capacities of the participants increase, their MNA scores and hand grip strengths also increase. Routine screening can be suggested for the low functional capacity and depression symptoms in addition to the nutritional disorders for the early diagnosis and treatment of malnutrition. Because the data we obtained as a result of the study are limited to only one nursing home, it can be suggested to work with wider sampling groups.

Competing interests

The authors declare that they have no competing interest.

Financial Disclosure

All authors declare no financial support.

Ethical approval

Before the study, permissions were obtained from local ethical committee

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