

ORIGINAL ARTICLE

Medicine Science 2021;10(4):1253-8

Nutritional status and independence in daily life activities of individuals aged 65 or over during the COVID-19 Pandemic in Turkey **Serap Gokce Eskin¹**,  **Aynur Esen Tureyen²**¹*Adnan Menderes University, Faculty of Health Science, Department of Nutrition and Dietetics, Aydin, Turkey*²*Ege University, Faculty of Nursing, Department of Internal Medicine Nursing, Izmir, Turkey*

Received 21 April 2021; Accepted 02 June 2021

Available online 26.09.2021 with doi: 10.5455/medscience.2021.04.131

Copyright@Author(s) - Available online at www.medicinescience.org

Content of this journal is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License.

**Abstract**

The prevalence of malnutrition in the elderly with COVID-19 is high. Maintaining daily life activities despite restrictions during the pandemic is also important for all individuals, not least those who are older. This study was carried out to determine the nutritional status and independence in daily life activities of the elderly during the pandemic period. This was a cross-sectional- descriptive study. Data were collected from a city center where West of Turkey and from 155 elderly people. The study data were collected from individuals who were determined using the snowball sampling method through phone calls with a personal information form, the Mini Nutritional Assessment Scale, and the Katz Activities of Daily Living Index. The study found that 60% of individuals aged 65 or older had malnutrition. The majority of the participants performed daily life activities independently. A moderate positive relationship was found between nutritional deficiencies and independence in daily life activities of the elderly. During the pandemic period, the nutrition and physical activity of the elderly are affected. The results suggest that nutrition and physical activity status of the elderly should be evaluated. National-level initiatives should be organized to meet the needs of the elderly during the pandemic.

Keywords: COVID-19, elderly, nutritional status, exercise**Introduction**

Coronaviruses are a family of viruses belonging to the Coronaviridae family known to infect mammals and birds. Coronavirus disease 2019 (COVID-19) is a kind of viral pneumonia which is caused by severe acute respiratory syndrome coronavirus 2. COVID-19 is the latest pathogen of a potentially deadly disease that emerged in Wuhan city, Hubei Province, China, in late December 2019 and rapidly became a global public health problem. According to a WHO report, 1, 861 005 deaths from the disease were identified in the World as of January 6, 2020, and total of 85.091 012 COVID-19 infection cases were confirmed [1,2].

COVID-19 can be the more severely afflicted by pneumonia, lymphopenia, exhausted lymphocytes, and a cytokine storm. The development of the disease depends on the interaction between the virus and the individual's immune system. These factors all contribute to whether an individual is infected, the duration and severity of the disease, and the incidence of reinfection [2]. Aged 65 or over in the high-risk group during the COVID-19 pandemic period. Age, comorbidities, and reduced immune function lead to a higher mortality rate in seriously ill elderly patients [3,4].

Nutrition plays an active role in the prevention, delay, and treatment of diseases related to aging. The nutrition of the elderly and the appropriate regulation of their eating habits are essential so that they can lead an independent, good-quality life. The risk of nutritional deficiency is common among aged individuals living in the community [4,5]. Problems associated with nutrition increase other factors that harm their health, regardless of pre-existing health problems [6]. Given the vulnerable condition of

***Corresponding Author:** Serap Gokce Eskin, Adnan Menderes University, Faculty of Health Science, Department of Nutrition and Dietetics, Aydin, Turkey
E-mail: serap.gokce@adu.edu.tr

elderly patients during the COVID-19 pandemic, nutritional health appears to be much more important today than in normal times [7]. Li et al. reported that the rate of malnutrition is high in the elderly during the pandemic process [8]. In elderly individuals with nutritional problems, some changes occur in the cardiorespiratory, gastrointestinal, and musculoskeletal systems. Moreover, malnutrition results in weakened immunity, which is also negatively impacted by changes that occur in the immune system with aging. Poor nutrition acts on the immune system of elderly people through cell-mediated immunity and impairment of cytokine production and phagocytic function [4-9]. Nutrition is closely related to functional status, which is adversely affected by symptoms of nutritional deficiency such as muscle weakness and fatigue [10]. In a study researchers found that independent risk factor for malnutrition was complete physical functional dependence [11]. Maintaining daily living activities is an important issue for elderly individuals, particularly during the restrictions imposed during the pandemic. The decline in functional abilities with aging tends to lead to a loss of independence [12]. Older people with poor physical health and self-sufficiency have difficulty maintaining their daily living activities. This, combined with malnutrition, may extend to a diminished ability to maintain their health and meet their daily needs and can lead to their becoming semi-dependent or fully dependent. According to a research malnutrition and nutritional intake are associated with returning home and ADL at discharge, respectively, after post-acute care [13]. Research has shown that, as elderly patients' cognitive functions deteriorate, their ADL levels decrease, nutrition is impaired, and functional capacity is negatively affected [14].

The present study was carried out to determine the nutritional status and independence in daily living activities of the elderly living in their own homes during the pandemic period in a city center that west of Turkey.

Materials and Methods

This study used a cross-sectional descriptive design. The size of the population was unknown. It consisted of individuals aged 65 or over living in the center of city in West of Turkey. Participants in the study were reached using the snowball sampling method. The sample size was calculated on G-power software using data from the study conducted by Demir et al. 2019 [14]. Accordingly, the sample was planned to include at least 124 individuals aged 65 or over, based on a 90% confidence interval, 5% error level, and moderate effect size. Given the likelihood of a 20% loss, the minimum sample size was eventually determined as 150. We collected data from 155 elderly. All individuals aged 65 or over who could be reached without going below the number determined with power analysis were included in the study. The data were collected by the researcher through phone calls with individuals aged 65 or over, who met the inclusion criteria, and who supplied contact information. Owing to the restrictions imposed during the pandemic process, the research was conducted from home. The snowball sampling method helped enlarge the sample size.

Data collection tools

A personal information form was designed by the researchers by reviewing the literature. The form consists of open-ended questions about sociodemographic characteristics, diagnosis of any disease,

and medication use.

Assessment of malnutrition conditions

The Mini Nutritional Assessment (MNA) scale developed specifically for the elderly was employed for the assessment of malnutrition status. Silva et al. (2020) stated that, although the MNA is not the gold standard, it shows a high sensitivity for the elderly with COVID-19 [5]. The MNA was developed by Guigoz et al. in 1994 [15]. The validity study of the MNA and MNA-SF scales in geriatric patients in Turkey was conducted by Sarıkaya and they was found that MNA was 94% sensitive and 81% specific [16]. The MNA include Anthropometric measurements global assessment (six questions related to lifestyle, medication, and mobility) dietary questionnaire (eight questions, related to number of meals, food and fluid intake, and autonomy of feeding), subjective assessment (self-perception of health and nutrition). These questions will yield the final MNA score, a score of less than 17 meaning malnutrition, scores between 17 and 23.5 indicating a risk of malnutrition, and a score greater than 23.5 means adequate nutritional status. In this study MNA Cronbach alpha was calculated as 0.85.

The Katz activities of daily living index (ADL)

The ADL index, developed by Katz et al. in 1963, assesses the activities necessary to meet the basic needs for daily living. The ADL index consists of six questions about bathing, dressing, toileting, transferring, continence, and feeding activities. In the ADL index, a score of 0–6 points means dependent, 7–12 points means semi-dependent, and 13–18 points means independent. The scale Cronbach's α was 0.838 [17,18]. In this study Cronbach's α was 0.824.

The data of the study were analyzed using the IBM SPSS 22 software package. In the analysis of the data, the number and percentage distribution values were used for the descriptive characteristics of the individuals aged 65 or over; an independent samples t-test and a One-Way ANOVA test were employed for parametric variables between the descriptive characteristics of the participants and the mean MNA and ADL scores. Pearson's correlation analysis was conducted to evaluate the relationship between the mean MNA and ADL scores.

The inclusion criteria included volunteering to participate in the study, being aged 65 or over, having no hearing problems or difficulty talking on the phone, oral feeding, and not bedridden.

Ethics of the study

This research was conducted in accordance with the Helsinki Declaration. The research protocol was approved by the Ethics Committee of Adnan Menderes University Faculty of Health Sciences (date and number: 16/06/2020-E.31156).

Results

The mean age of the individuals who participated in our study was 74.80 ± 6.30 years. Also, 53% of the participants were male. Approximately 70% of the participants were primary school graduates, and the majority reported their economic status as satisfactory. As seen in Table 1, 70% of the participants did not

live alone, and half had a moderate BMI. Moreover, 49% of the participants were at risk for malnutrition. However, 66.5% were independent in daily living activities (Table 1).

In our study, the daily living activities of individuals aged 65 or over during the COVID-19 pandemic were evaluated. There was a statistically significant difference between the daily living activity levels of the participants by age and BMI (Table 2).

Factors affecting the malnutrition level of the participants included

age, loneliness, and BMI. These differences were statistically significant (Table 3).

The results of our study indicated that there was a moderate positive ($r=0.433$) relationship between the nutritional status and independence in daily living activity levels of individuals aged 65 or over during the COVID-19 pandemic period. This relationship was statistically significant ($p<0.000$) (Table 4). Information about other variables is also given in tables.

Table 1. The sociodemographic characteristics of the participants

Sociodemographic Characteristics		n	%
Age (years)	65–79	111	71.6
	> 80	44	28.4
Gender	Female	72	46.5
	Male	83	53.5
Education	Primary	108	69.7
	High	47	30.3
Economic status	Poor	39	25.2
	Adequate	116	74.8
Lonely	Yes	46	29.7
	No	109	70.3
BMI	18.5–24.9	31	20.0
	> 25	124	80.0
Chronic disease	Yes	143	92.3
	No	12	7.7
MNA	Malnutrition (+)	41	26.5
	Risk of malnutrition	99	63.9
	Malnutrition (-)	15	9.7
Katz	Independent	103	66.5
	Semi-dependent	52	33.5

Table 2. Participants' independence in performing daily life activities

		Semi-dependent	Independent	Statistic
Age (years)	65–79	27	84	t=14.923
	> 80	25	19	p=0.000
Gender	Female	16	56	t=0.204
	Male	16	67	p=0.651
Education	Primary	37	71	t=2.613
	High	10	37	p=0.106
Economic status	Poor	16	23	t=2.806
	Adequate	31	85	p=0.093
Lonely	Yes	17	29	t=0.341
	No	35	74	p=0.559
BMI	18.5–24.9	15	17	t=12.759
	> 25–29.9	37	86	p=0.002
Chronic disease	Yes	46	97	t=1.579
	No	6	6	p=0.209

Table 3. Malnutrition among the participants

		Malnutrition	Risk for malnutrition	No risk for malnutrition	Statistic
Age	65–79	13	90	8	$\chi^2= 6.244$
	> 80	32	7	5	p=0.000
Gender	Female	21	44	7	$\chi^2= 0.333$
	Male	24	53	6	p=0.847
Education	Primary	30	71	7	$\chi^2= 2.304$
	High	15	26	6	p=0.332
Economic status	Poor	17	20	2	$\chi^2= 5.527$
	Adequate	28	77	11	p=0.063
Lonely	Yes	26	17	3	$\chi^2= 24.161$
	No	19	80	10	p=0.000
BMI	18.5–24.9	23	8	0	$\chi^2= 39.547$
	> 25	22	89	13	p=0.000
Chronic disease	Yes	41	89	13	$\chi^2= 1.208$
	No	4	8	0	p=0.546

Table 4. Correlation between daily living activities and malnutrition status of individuals aged 65 or over

KATZ	r	MNA
		p
		0.433
		0.000

Discussion

This study investigated the nutritional status and performance of daily living activities of individuals aged 65 or over in the high-risk group during the COVID-19 pandemic period. According to our study, 63% of the participants were at risk for malnutrition. Our findings were consistent with the literature. Wafi et al. reported results similar to ours, finding that 62% of elderly people living in nursing homes were at risk for malnutrition [19]. In a cross-sectional study conducted with participants aged 65 or over, Mohammed et al. found the rate of malnutrition risk to be 64% [20]. COVID-19 is associated with a high risk of malnutrition, primarily in older people [5,11]. Elderly individuals who were isolated at home during the pandemic may have had problems in access to food and in preparing food. Curfews were applied in Turkey for individuals over the age of 65. However, since elderly people who did not leave home consumed less energy, their energy intake may have decreased. It is known that absorption disorder, increased nutrient losses, comorbidity, and decreased dietary intake seen with old age can also increase the risk of malnutrition [21]. It has been reported that isolation during the pandemic increased the prevalence of conditions such as anxiety, depression, and insomnia. Consequently, nutrition may have been adversely affected [22]. In a study conducted in China, the malnutrition risk was 27% in the elderly diagnosed with COVID-19, and the rate of malnutrition was found to be 52% [8]. In the present study, the participants were not diagnosed with COVID-19; hence the results were different from other studies.

According to our study, the majority of individuals aged 65 or over maintained their daily living activities independently. Wafi et al. found that 20% of individuals aged 65 or over in their study were independent. However, while the sample of our study was

composed of elderly individuals living in their own homes, the sample in the study of Wafi et al. consisted of elderly people living in nursing homes [19]. COVID-19 has forced nationwide lockdowns in many countries, forcing most people to self-isolate at home. The physical and psychological consequences of this situation could be particularly worrisome for older people [23]. Physical inactivity due to quarantine and social isolation may increase the risk of damage to the immune, respiratory, cardiovascular, and musculoskeletal systems. As a result, their mobility decreases [24]. However, in the present study, individuals aged 65 or over were observed to meet their needs at home.

According to the results of the present study, the risk of malnutrition and incidences of malnutrition increased with age. Aging is associated with decreased functional status [19]. Donini et al. [2020] reported that age and physical and mental health were important determinants of malnutrition status and that the prevalence of malnutrition increased after the age of 70 [10]. Nutritional status can easily deteriorate owing to physiological changes with age. Increasing catabolic activities, decreasing anabolic activities, and the accompanying deterioration of functional status with advancing age impede access to and preparation of food [19]. According to our study, while the rate of independence was high under the age of 80, it decreased with age. Wafi et al. (2019) found that 60% of the participants were semi-dependent [19]. The decline in health with aging is generally associated with changes in body composition, such as changes in the musculoskeletal system and cardiovascular system [19,24]. This is an expected result when the effects of quarantine and social isolation due to COVID-19 are combined with the changes due to aging.

The present study found, consistent with the literature [25], that the risk of malnutrition was higher in older people who were

overweight or obese. Approximately half of the participants with a BMI of 25 and above carried a risk for malnutrition. In the study by Bahat et al. (2012), the rate was found to be 30% [25]. In our study, it was thought that the risk of malnutrition was higher than the other study's results. Because the participants were in quarantine. Functional capacity is expected to decrease in obese and overweight individuals because of the associated chronic diseases that accompany these conditions. However, in our study and the study of Bahat et al., the functional status was better in groups with high BMI. It is suggested that the upper limit value of BMI for functional independence in the elderly may be higher 30 kg / m² [25].

In the present study, the risk of malnutrition was found to be higher in individuals who lived alone. In their study conducted with individuals aged over 80, Wham et al. (2011), reported causes of malnutrition risk as low self-rated health, disability and social factors, losing a spouse and loneliness [26]. Nutritional deficiency is an important problem for the elderly living alone. Ulfiana et al. identified the reasons for this as advanced age, economic insufficiency, and loneliness [27]. The results of our study were consistent with the literature. Access to food and going shopping were more difficult for older people, especially during the pandemic, owing to lockdown restrictions. However, it is thought that anxiety caused by inactivity and the pandemic may also lead to anorexia. Here, the possibility of nutritional deficiency increases in lonely elderly individuals who cannot receive support.

The present study found a moderate positive correlation between the nutritional status and the functional status of individuals aged 65 or over during the pandemic. This finding is consistent with that of Wafi et al.'s (2019) study of elderly people living in nursing homes [19]. Mohammed et al. reported that the risk of malnutrition increased as physical activity decreased in individuals aged 65 or over [20]. Another study found that malnutrition and poor nutritional intake are determinants of daily living activities in elderly [13]. Nutritional status is closely related to functional status. Malnutrition results in reduced anatomic functions such as preparing food; therefore, food intake decreases. Besides, muscle weakness and fatigue due to nutritional deficiency adversely affect functional status [10,11].

Conclusions

Owing to the restrictions and quarantine imposed during the pandemic, the risk for nutritional deficiency is high in individuals aged 65 or over. Nutritional deficiency was found in the present study to be higher in individuals with advanced age who were overweight or obese or who lived alone. Functional status, on the other hand, was affected by low body mass index and advanced age. In line with these results, we recommend that the nutritional and functional status of individuals aged 65 or over who are at risk and who are subject to restrictions during the pandemic period should be regularly assessed and supported if they need help. For this purpose, it is recommended that municipalities and social organizations provide food support to elderly people, offer assistance with grocery shopping, and encourage them to stay active.

Limitations

This study was conducted in a single city center; therefore, it is not sufficient to generalize the situation of the elderly in different regions and rural areas. Participation of the elderly who can make phone calls is another limitation in this study. In addition, it is thought that the study was conducted in a homogeneous group due to the use of snowball sampling method.

Our pre-publication study was presented as an oral presentation at the Istanbul Yeni Yüzyıl University National Nursing Congress held between 14-16 June 2021.

Best regards

Conflict of interests

The authors declare that they have no competing interests.

Financial Disclosure

All authors declare no financial support.

Ethical approval

This research was conducted in accordance with the Helsinki Declaration. The research protocol was approved by the Ethics Committee of Adnan Menderes University Faculty of Health Sciences (date and number: 16/06/2020-E.31156).

References

1. World Health Organisation (WHO). Coronavirus 2020. Available from: <https://www.who.int/data/> (Accessed 07.01.2021).
2. Li X, Geng M, Peng Y, et al. Molecular immune pathogenesis and diagnosis of COVID-19. *J Pharmaceut Analysis* 2020;10:102-08.
3. Niu S, Tian S, Lou J, et al. Clinical characteristics of older patients infected with COVID-19: a descriptive study. *Arch Gerontol Geriatr.* 2020;89:104-58.
4. Ali AM, Kunugi H. Approaches to nutritional screening in patients with coronavirus disease 2019 (COVID-19). *Int J Environ Res Public Health.* 2021;18:2772.
5. Silva DFO, Lima SCVC, Sena-Evangelista KCM. et al. Nutritional risk screening tools for older adults with COVID-19: a systematic review. *Nutrients.* 2020;12:2956-70.
6. Bencivenga L, Rengo G, Varricchi G. Elderly at time of coronavirus disease 2019 (COVID-19): possible role of immunosenescence and malnutrition. *GeroScience.* 2020;42:1089-92.
7. Azzolino D, Saporiti E, Proietti M, et al. Nutritional considerations in frail older patients with COVID-19. *J Nutr Health Aging.* 2020;24:1-3.
8. Ning H, Du Y, Ellis D. et al. Malnutrition and its associated factors among elderly Chinese with physical functional dependency. *Public Health Nutrition.* 2021;24:1404-14.
9. Silverio R, Gonçalves DC, Andrade MF, et al. Coronavirus disease 2019 (COVID-19) and nutritional status: the missing link? *Adv Nutr.* 2020; 00:1-11.
10. Donini LM, Stephan BCM, Rosano A, et al. What are the risk factors for malnutrition in older-aged institutionalized adults? *Nutrients.* 2020;12: 2857-66.
11. Arik G, Dogan Varan H, Yavuz BB, et al. Validation of Katz Index of Independence in activities of daily living in Turkish older adults. *Arch Gerontol Geriatr.* 2015;61:344-50.
12. Maeda K, Koga T, Akagi J. Nutritional variables predict chances of returning home and activities of daily living in post-acute geriatric care. *Clin Interv Aging.* 2018;13:151-7.
13. Demir Akca AS, Saracli O, Emre U, et al. Relationship of cognitive functions with daily living activities, depression, anxiety and clinical variables in hospitalized elderly patients. *Archives Neuropsych.* 2014;51:267-74.
14. Guigoz Y, Vellas B, Garry PJ. Mini Nutritional Assessment: a practical assessment tool for grading the nutritional status of elderly patients. *Facts Res Gerontol.* 1994;4:12-13.

15. Sarikaya D, Halil M, Kuyumcu ME, et al. Mini nutritional assessment test long and short form are valid screening tools in Turkish older adults. *Arch Gerontol Geriatr*. 2015;61:56-60.
16. Katz S, Ford AB, Moskowitz RW, et al. Studies of illness in the aged. The Index of ADL: a standardized measure of biological and psychosocial function. *JAMA*. 1963;185:914-19.
17. Diker J, Etiler N, Yildiz M, et al. Association between cognitive status and activities of daily living, life quality and some demographic variables in older than 65. *Anatol J Psych*. 2001;2:79-86.
18. Wafi AF, Susilo H, Nariswari AS. Nutritional status and functional status among elderly in Santo Yosef Surabaya Nursing Home. *J Widya Medika Junior*. 2019;1:137-45.
19. Muhamad AR, Hamirudin AH, Zainudin N, et al. Nutritional risk according to Mini Nutritional Assessment-short form among community dwelling elderly in Kuantan, Pahang: a pilot study. *Inter J All Heal Sci*. 2019;3:658-67. [Internet]. Available from: <https://journals.iium.edu.my/ijahs/index.php/IJAHS/article/view/188>. Accessed: 15.05.2021.
20. Volkert D, Kiesswetter E, Cederholm T. et al. Development of a model on determinants of malnutrition in aged persons: A MaNuEL Project. *Gerontol Geriatr Med*. 2019;5:1-8.
21. Mattioli AV, Sciomer S, Cocchi C, et al. Quarantine during COVID-19 outbreak: changes in diet and physical activity increase the risk of cardiovascular disease. *Nutr Metab Cardiovas*. 2020;30:1409-17.
22. Li T, Zhang Y, Gong C, et al. Prevalence of malnutrition and analysis of related factors in elderly patients with COVID-19 in Wuhan, China. *Eur J Clin Nutr*. 2020;74: 871–5.
23. Carriedo A, Cecchini JA, Fernandez-Rio J, et al. COVID-19, psychological well-being and physical activity levels in older adults during the nationwide lockdown in Spain. *Am J Geriatr Psychiatry*. 2020;11:1146–55.
24. Woods JA, Hutchinson NT, Powers SK, et al. The COVID-19 pandemic and physical activity. *Int Congr Ser*. 2020;2:55-64.
25. Bahat G, Tufan F, Saka B, et al. Which body mass index (BMI) is better in the elderly for functional status? *Arch Gerontol Geriatr*. 2012;54:78-81.
26. Wham CA, Teh RO, Robinson M, et al. What is associated with nutrition risk in very old age? *J Nutr Health Aging*. 2011;15:247-51.
27. Ulfiana E, Anggraini OR, Fauziningtyas R. How do I fulfill my nutrition: the experience of older adults who live alone. *Indian J Pub Health Res & Devel*. 2019;10:2724.