Investigation of Malnutrition and Sarcopenia in Individuals Aged 65 and Over Receiving Both Nursing Home or Home Care Services*

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Aim: This study examines the physical activity levels, malnutrition, and sarcopenia status of elderly individuals receiving nursing home or home care services.

Method: The research was conducted in Manisa between November 2024 and February 2025 with a total of 180 elderly individuals aged 65 and over, 93 of whom were women and 87 men, all of whom were either receiving home care services or residing in a nursing home. Sociodemographic information was obtained through a structured questionnaire. Nutritional status was evaluated using the Mini Nutritional Assessment (MNA), while muscle strength was determined through a handgrip strength test. Additionally, a 24-hour dietary recall was collected during face-to-face interviews.

Results: Regarding income status, 29.9% of elderly individuals receiving home care had no income, whereas this rate was only 1.2% among those living in a nursing home. Regarding water consumption, it was observed that in both groups, the elderly consumed less than 2 liters per day, indicating inadequate fluid intake. As for physical activity levels, 39.2% of elderly individuals receiving home care and 44.6% of those in nursing homes reported walking for 30 minutes or more per day. When it comes to malnutrition, 38.1% of home care participants and 22.9% of nursing home residents were found to be at risk of malnutrition. Additionally, 6.2% of home care participants and 3.6% of those in the nursing home were classified as malnourished. Regarding sarcopenia, based on handgrip strength tests, 11.3% of home care participants and 22.9% of nursing home residents had low handgrip strength, indicating a potential risk of sarcopenia.

Conclusion: Elderly individuals who received care at home exhibited a higher rate of malnutrition compared to those residing in nursing homes. In contrast, the rate of low handgrip strength—indicating reduced muscle strength—was higher among nursing home residents than among elderly individuals receiving home care. As a result, both in home care and nursing home settings, it was determined in this study through sociodemographic surveys conducted via face-to-face interviews that the elderly individuals' water intake was below 2 liters, and their physical activity levels were insufficient. Therefore, it is essential to raise awareness among elderly individuals in both care settings about proper nutrition and regular physical activity.

Keywords: Elderly, malnutrition, sarcopenia, water intake, physical activity.

Huzurevinde ve Evde Bakım Desteği Alan 65 Yaş ve Üstü Bireylerin Malnütrisyon ve Sarkopeni Yönünden İncelenmesi

Öz

Amaç: Bu araştırmada huzurevinde ve evde bakım desteği alan yaşlı bireylerin fiziksel aktiviteleri, malnütrisyon ve sarkopeni yönünden incelenmesi amaçlanmıştır.

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Yöntem: Araştırma, Kasım 2024 – Şubat 2025 tarihleri arasında Manisa'da huzurevinde kalan ve aynı zamanda evde bakım desteği alan 65 yaş ve üstü 93'ü kadın 87'si erkek olmak üzere 180 yaşlı birey üzerinde yürütülmüştür. Katılımcıların sosyodemografik özelliklerini belirlemek için anket formu, malnütrisyon durumlarını saptamak amacıyla Mini Nütrisyonel Değerlendirme Testi (MNA), kas gücünü ölçebilmek için el kavrama gücü testi uygulanmıştır. Ayrıca tüm yaşlı bireylerin 24 saatlik besin tüketim kaydı yüz yüze görüşülerek çıkarılmıştır.

Bulgular: Gelir durumları açısından, evde bakım alan yaşlı bireylerin gelirinin olmama durumu %29,9 iken, huzurevindekiler için bu oran %1,2 olarak bulunmuştur. Su tüketimi açısından, iki grubun da su tüketimlerinin 2 litrenin altında olduğu, yani yetersiz su tükettikleri görülmektedir. Fiziksel aktivite düzeyleri açısından, evde bakım alan yaşlı bireylerin %39,2'sinin, huzurevinde bakım alan yaşlı bireylerin %44,6'sının günde 30 dakika ve üstü yürüyüş yaptığı görülmektedir. Malnütrisyon durumları açısından, evde bakım alan katılımcıların %38,1'inin, huzurevinde bakım alan katılımcıların %22,9'unun malnütrisyon riski altında olduğu görülürken evde bakım alan katılımcıların %6,2'sinin, huzurevinde kalan katılımcıların %3,6'sının malnütrisyonlu olduğu saptanmıştır. Sarkopeni durumları, yani el kavrama gücü testi bakımından, evde bakım alan katılımcıların %11,3'ü, huzurevinde bakım alan katılımcıların ise %22,9'u zayıf el kavrama gücüne sahiptir.

Sonuç: Malnütrisyon görülme oranı evde bakımda huzurevine kıyasla daha yüksek bulunmuştur. El kavrama gücü ile yapılan incelemede ise huzurevinde evde bakıma kıyasla zayıf el kavrama gücü daha yüksek bulunmuştur. Sonuç olarak hem evde bakım hem de huzurevi ortamlarında, bu çalışmada yüz yüze görüşmelerle yapılan sosyodemografik anketler aracılığıyla, yaşlı bireylerin su tüketiminin 2 litrenin altında olduğu ve fiziksel aktivitelerinin yetersiz olduğu belirlenmiştir. Bu sebepten evde bakım alan ve huzurevinde yaşayan yaşlı bireylerin beslenme ve fiziksel aktivite açısından bilinçlendirilmesi gereklidir.

Anahtar Sözcükler: Yaşlı, malnütrisyon, sarkopeni, su tüketimi, fiziksel aktivite.

Introduction

Aging is a process that gradually diminishes an individual's physical and mental capacities. According to the World Health Organization (WHO), individuals aged 65 and older are considered elderly, and this stage is further divided into three subgroups: 65-74 (young-old), 75-84 (old), and 85 and above (oldest-old)[1].

According to 2023 data, the global proportion of the elderly population was found to be 10.0%, while the proportion in Turkey was slightly higher at 10.2%[2]. Of this population, 44.6% were male and 55.4% were female[3].

Adequate and balanced nutrition becomes increasingly important with aging. Aging is widely recognized as a key contributor to the increased likelihood of malnutrition among the elderly. Inadequate nutrition can lead to a weakened immune system and muscle loss. Sufficient nutrient intake helps protect tissues and organs against infections. Therefore, proper nutrition is a critical concern for elderly individuals[4].

Factors contributing to inadequate nutrition include living alone, level of education, and socioeconomic status[5]. Elderly individuals who live alone often experience negative effects on their nutrition and, for these reasons, may prefer to live in nursing homes. Consequently, the prevalence of malnutrition among the elderly can reach up to approximately 50%[6].

Inadequate nutrition leads to malnutrition and sarcopenia. Malnutrition is a condition that causes changes in body weight and impairs physical and mental functions[7].

Defined as a geriatric syndrome by the European Working Group on Sarcopenia in Older People (EWGSOP)[5]. Sarcopenia is marked by a continuous reduction in both muscle

mass and physical function[8]. In addition to being a significant concern for older adults, sarcopenia also increases the risk of disability and falls[9].

In our country, the number of studies on malnutrition and sarcopenia among elderly individuals by region is insufficient. This study examined the nutritional status, levels of physical activity, and the occurrence of both malnutrition and sarcopenia in individuals aged 65 and older who were either receiving home care or living in institutional settings within the Manisa area.

Material and Methods

Partipicants

This study was carried out in Manisa between November 2024 and February 2025 with a total of 180 older adults aged 65 and above, including 93 women and 87 men. The participants consisted of individuals either residing in nursing homes or receiving home care support. Data were obtained through face-to-face surveys.

Sociodemographic Form

A questionnaire consisting of 11 questions was administered to determine the sociodemographic characteristics, health status, physical activity levels, and nutritional status of the elderly individuals.

Mini Nutritional Assessment (MNA): The Mini Nutritional Assessment (MNA) was administered to determine the nutritional status of elderly individuals. The MNA consists of two parts. In the first part, participants can score up to a maximum of 14 points. There are three levels of nutritional status: a score of 12–14 points indicates normal nutritional status, 8–11 points indicates a risk of malnutrition, and 0–7 points indicates malnutrition.

If a participant is found to be at risk of malnutrition in the first part, the second part of the assessment is conducted. In this section, the maximum score is 16 points. The scores from both parts are then summed. Based on the total score, three nutritional categories are identified: According to the scoring system, a total score between 24 and 30 indicates a normal nutritional state, while scores ranging from 17 to 23.5 suggest a potential risk for malnutrition. Values below 17 are considered indicative of malnutrition[10].

24-Hour Dietary Recall: A 24-hour dietary recall was conducted to assess the daily energy and nutrient intake of the elderly individuals. Nutritional intake was evaluated through the use of BeBiS version 7.2, a specialized software designed for dietary analysis. To assess dietary intake, participants were prompted to remember and report everything they had consumed in the previous day, including meals and snacks, along with portion sizes[11].

Handgrip Strength Test: Muscle strength in older adults was evaluated using a handgrip test, which served as an indicator of physical capability. Measurements were taken from the participants' dominant hands using a CAMRY brand hand dynamometer, whose reliability and validity have been proven. According to the EWGSOP2 (European Working Group on Sarcopenia in Older People, second consensus) criteria, handgrip strength values are interpreted as low muscle strength when they are below <16 kg for women and <27 kg for men[12].

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Ethical Statement

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Data Analysis

Statistical evaluations were carried out using IBM SPSS software, version 25.0. Descriptive analyses, including measures such as the mean and standard deviation, were applied to summarize the study variables. For quantitative data that met the assumptions required for parametric testing, comparisons between two independent groups were made using the Independent Samples T-test. For categorical variables, the Chi-Square test was conducted to determine whether there was a significant association between frequency and percentage distributions. The results were evaluated within a 95% confidence interval, with statistical significance set at $p<0.05$.

Results

An analysis of educational attainment revealed that a greater proportion of elderly individuals receiving home-based care 93.8% had completed primary school compared to those residing in nursing homes.

When examining living arrangements, 35% of elderly individuals receiving home care and only 3.6% of those in nursing homes were living with their spouses, while the majority in both groups were living alone.

Assessment of income levels indicated that most elderly individuals, whether receiving care at home or residing in nursing homes, had earnings below the minimum wage threshold. Among the elderly receiving home care, 29.9% reported having no income at all, while this rate was only 1.2% among those living in nursing homes.

When examining the presence of chronic diseases, the prevalence was found to be high in both groups.

When examining nutritional habits, it was observed that 100% of elderly individuals living in nursing homes consumed more than three meals a day, whereas this rate was 35.1% among those receiving home care.

When examining water consumption, it was found that elderly individuals in both groups consumed less than 2 liters of water per day, indicating insufficient hydration.

When examining physical activity levels, 39.2% of elderly individuals receiving home care and 44.6% of those in nursing homes were found to engage in 30 minutes or more of physical activity per day, which is considered insufficient. The demographic characteristics of the participants are presented in Table 1.

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

	Home Care (n=97)		Nursing Home (n=83)			
Education Level	**n**	**%**	**n**	**%**	**x²**	**p**
Primary School	91	93.8	65	78.3	9.815[a]	0.020*
Middle School	3	3.1	8	9.6		
High School	1	1.0	6	7.2		
University	2	2.1	4	4.8		
Marital Status						
Single	63	64.9	80	96.4	27.069[a]	0.000*
Married	34	35.1	3	3.6		
Income Level						
Below Minimum Wage	66	68.0	65	78.3	37.119[a]	0,000*
Above Minimum Wage	2	2.1	17	20.5		
No Income	29	29.9	1	1.2		
Presence of Chronic Illness						
Yes	80	82.5	63	75.9	1.182[a]	0.277
No	17	17.5	20	24.1		
Number of Daily Meals						
1-3 meals	63	64.9	0	0.0	82.934[a]	0.000*
3-5 meals	34	351	83	100.0		
Daily Water Consumption						
1-2 glasses	35	36.1	13	15.7	9.543[a]	0.008*
2-3 glasses	35	36.1	40	48.2		
3 or more glasses	27	27.8	30	36.1		
Physical Activity (Walking)						
30 minutes	33	34.0	23	27.7	6.609	0.037*
30-60 minutes	5	5.2	14	16.9		
No	59	60.8	46	55.4		

When examining nutritional status, it was found that elderly individuals receiving home care were consuming insufficient amounts of energy and protein compared to those living in nursing homes. Additionally, when intake levels of calcium, magnesium, and table salt — which are important for older adults — were examined, the intake of calcium and magnesium was found to be higher among elderly individuals living in nursing homes. However, table salt consumption was higher among those receiving home care compared to nursing home residents. The participants' macro- and micronutrient intake information is presented in Table 2 and Table 3.

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Table 2. Evaluation of participants' macronutrient intake (n=180)

	Home Care (n=97)		Nursing Home (n=83)			
Nutrients	**X̄**	**Ss**	**X̄**	**Ss**	**t[b]**	**p**
Energy (kcal)	1126.01	334.91	1304.12	340.05	-3.532	0.001*
Protein (g)	38.12	14.53	52.51	16.74	-6.172	0.000*
Fat (g)	47.46	18.28	56.91	18.32	-3.455	0.001*
Carbohydrate (g)	133.66	45.41	141.21	39.75	-1.177	0.241

a.Independent samples T test, *p<0,05

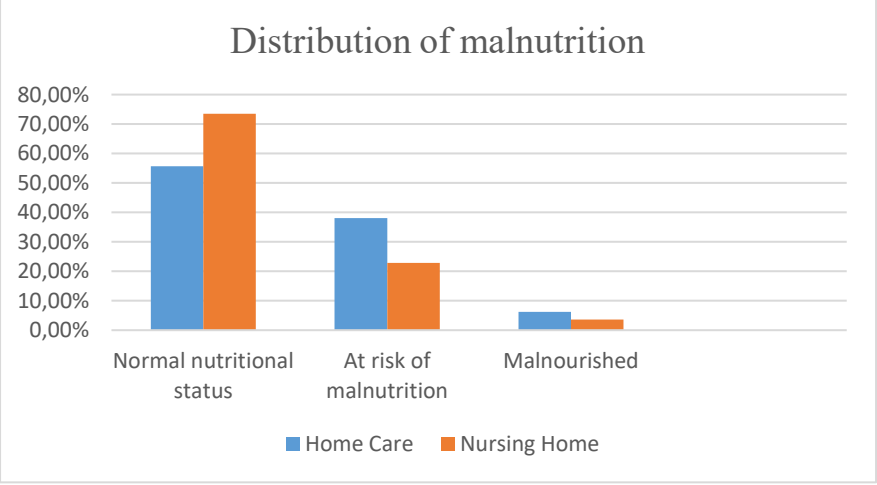
Table 3. Evaluation of participants' micronutrient intake (n=180)

	Home Care (n=97)		Nursing Home (n=83)			
Nutrients	**X̄**	**Ss**	**X̄**	**Ss**	**t[b]**	**p**
Table Salt (g)	5.86	2.29	7.90	2.55	-5.652	0.000*
Calcium (mg)	442.66	179.77	630.90	198.30	-6.678	0.000*
Magnesium (mg)	128.95	54.28	178.20	49.28	-6.330	0.000*

b. Independent samples T test, *p<0,05

When malnutrition, or inadequate nutrition, was examined, it was found that 55.7% of the home care participants and 73.5% of the nursing home residents were adequately nourished. However, 38.1% of the home care participants and 22.9% of the nursing home residents were found to be at risk of malnutrition. Additionally, 6.2% of the home care participants and 3.6% of the nursing home residents were identified as malnourished. The distribution of malnutrition among the participants is presented in Figure 1.

Figure 1. Distribution of malnutrition



When sarcopenia status, assessed by the handgrip strength test, was examined, 11.3% of the home care participants and 22.9% of the nursing home residents were found to have low handgrip strength. Meanwhile, 88.7% of the home care participants and 77.1% of the

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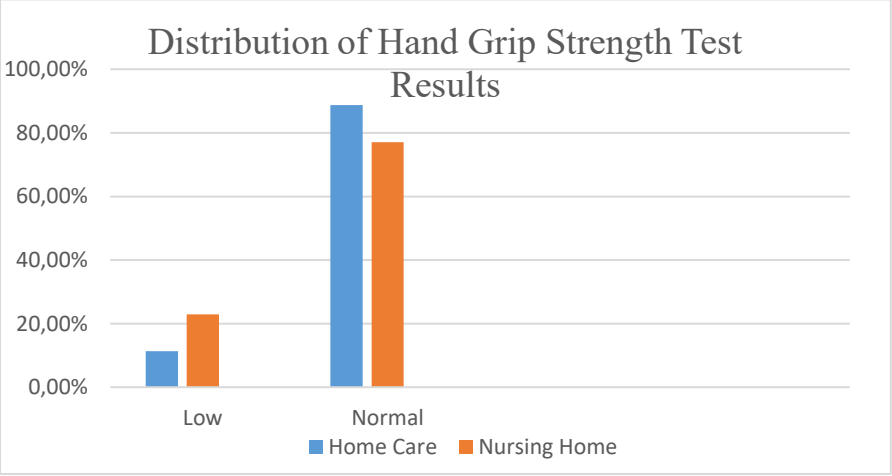
nursing home residents had normal handgrip strength. The distribution of the participants' handgrip strength test results is presented in Figure 2.

Figure 2. Distribution of participants' handgrip strength test results



Discussion

The poverty rate among elderly individuals in Turkey is 23.3% of the total population[3]. In this study, it was observed that elderly individuals with good financial status tend to prefer nursing homes, whereas those with lower income levels tend to prefer home care support. It has been reported that as the income levels of elderly individuals increase, their quality of life also improves[13].

In Turkey, 46.7% of elderly individuals are primary school graduates[3]. In this study, it was observed that 93.8% of the elderly receiving home care were primary school graduates, while this rate was also high in nursing homes, at 78.3%.

According to the Turkish Statistical Institute (TÜİK), 78.7% of elderly individuals in Turkey have a chronic illness[3]. In this study, the rate of chronic illness among elderly individuals receiving home care was found to be 82.5%, while it was 75.9% among those living in nursing homes. Other studies have shown that approximately 78.9% of elderly individuals have chronic illnesses[14-16]. Evidence from another study suggests that older adults who have at least one chronic illness face an increased likelihood of developing malnutrition[17]. Similarly, in this study, individuals receiving home care had higher rates of chronic illness and malnutrition, supporting previous research findings.

Water is an essential nutrient defined as the fundamental element of life[18]. With aging, the functions of the body slow down, and the need for water increases[19]. Studies have shown that elderly individuals consume less than 2 liters of water per day and that there is a correlation between educational level and water consumption[18,20,21]. In this study as well, it was observed that water consumption was below 2 liters in both home care and nursing home settings. Additionally, elderly individuals receiving home care had lower levels of both education and water consumption compared to those living in nursing homes. The results obtained in this study show a clear parallel with earlier academic research in the field.

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Beyond the biological transformations brought on by the aging process, insufficient physical activity leads to health problems, muscle weakness, and, similarly, chronic diseases[22]. Physical activity is essential to prevent sarcopenia, which emerges with aging[23]. Studies have shown that the rate of physical activity among elderly individuals is quite low, at around 26.7%, with walking being the most preferred form of exercise[24,25]. In this study, the rate of elderly individuals who walk for 30 minutes or more per day was found to be 39.2% among those receiving home care and 44.6% among those living in nursing homes. Low levels of physical activity were observed in both participant groups.

Malnutrition may arise due to various physical, psychological, or financial challenges. It has detrimental effects on overall well-being and, especially in the elderly, it is associated with a higher risk of falling, slower recovery from illnesses or injuries, and increased susceptibility to infections[26]. The prevalence of malnutrition varies by setting, affecting approximately 5% of older adults residing in the general population, 20–40% of those in institutional care, and 20–50% of hospitalized elderly patients[27]. In this study, it was found that 38.1% of participants receiving home care and 22.9% of those in nursing homes were at risk of malnutrition. Additionally, 6.2% of home care participants and 3.6% of nursing home residents were found to be malnourished. Previous studies have reported that approximately 35% of elderly individuals are at risk of malnutrition, while 17% are malnourished. This study is consistent with the findings of previous research[28-31]. Studies examining the energy and protein intake of elderly individuals have shown that they are generally undernourished[32,33]. In this study as well, it was found that elderly individuals had insufficient energy and protein intake; however, those receiving home care had lower energy and protein intake compared to those living in nursing homes. These findings are consistent with previous studies.

Hand grip strength is influenced by factors such as nutrition and physical activity[34]. In this study, the proportion of individuals with weak hand grip strength was higher among those living in nursing homes, and physical activity levels were low in both groups. Previous studies have shown that 19–52.6% of elderly individuals are diagnosed with sarcopenia[35,36]. Previous research has similarly reported that older adults often consume insufficient amounts of calcium and magnesium[33,37]. In parallel with previous findings, this study revealed that both groups had insufficient calcium and magnesium consumption, with those receiving care at home showing the lowest levels.

Conclusion

Among older adults, both malnutrition and sarcopenia represent frequently encountered and clinically important health issues. Risk factors for these conditions include inadequate nutrition, low physical activity, living alone, low educational level, and poor income status. This study was conducted in the Manisa region, focusing on individuals with low income levels living in nursing homes and those receiving home care support. Malnutrition was more prevalent in individuals receiving home care, whereas sarcopenia was more common among those living in a nursing home. Additionally, insufficient engagement in physical movement and inadequate hydration were common in both groups—issues of particular concern for the elderly.

In conclusion, elderly individuals receiving home care support due to poor economic conditions are more likely to experience inadequate nutrition compared to those living

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in nursing homes, both because of financial difficulties and less favorable living conditions. Early diagnosis of health issues such as malnutrition and sarcopenia is crucial for elderly individuals, whether they live in institutions or at home. Therefore, providing regular education and conducting routine screenings for malnutrition and sarcopenia are essential to ensure a healthier and more comfortable life for elderly individuals in their remaining years.

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