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## Original Research

# Sociodemographic Characteristics of Patients Registered with a Home Care Unit and an Evaluation of the Health Services Offered

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### Abstract

**Objectives:** The growing aging population and the difficulties they often face in accessing health services brought attention to home care units. Home care units provide services that make it easier for the elderly to meet their healthcare needs. The aim of this study was to evaluate the sociodemographic characteristics of patients who were served by the home care unit of one hospital family medicine clinic and to assess the services provided.

**Methods:** The records of patients who were served by the home care unit of one hospital between January 1 and December 31, 2016, were retrospectively screened. The age, gender, diagnosis, frequency of home care visits, requested consultations and examinations, emergency service requests, and the details of patients who died were recorded. The data were statistically analyzed with a chi-square test and Student's t-test.  $P < 0.05$  was considered statistically significant.

**Results:** In 2016, 716 (64.8%) female and 389 (35.2%) male patients (total  $n=1105$ ) were served by the unit. The mean age of the group was  $78.24 \pm 15.43$  years. When separated by age group, 87.1% of the patients were aged  $\geq 65$  years. There were more female patients than males among those older than 65 years, while the reverse was true among patients younger than 65 years of age. The most common diagnosis in the study group was Alzheimer's disease, followed by essential hypertension and diabetes mellitus. An average of 6.54 visits was made during the year. More than half ( $n=624$ , 56.5%) of the patients were visited 4 or more times. The number of visits increased with greater age. Overall, Alzheimer's disease patients received 3 or fewer visits, while 4 or more visits were made to patients with essential hypertension and endocrine disorders.

A hemogram was requested for 83% ( $n=917$ ) of the patients, biochemical tests for 63.5% ( $n=702$ ), complete urinalysis for 34.9% ( $n=386$ ), and a hormonal assay for 65.1% ( $n=719$ ). In all, 39.3% ( $n=432$ ) of the patients sought emergency service at least once. Consultations were not requested for 24 (2.2%) patients. A neurology consultation was the most frequently requested, for a total of 6 (0.25%) patients. During this period of follow-up, 114 (10.4%) patients died. Alzheimer's disease was statistically significantly correlated with mortality (39.5%,  $n=45$ ;  $p=0.031$ ).

**Conclusion:** Given the aging population, the provision of home health care services is growing in importance. It is most commonly expected to serve patients over 65 years of age and those with neurological diseases. In this study, patients with a diagnosis of essential hypertension or an endocrine disorder were visited more often. Multiple illnesses among elderly patients often lead to a greater number of tests and visits, and abnormal/erroneous results also contribute to the number of visits. Requests for unnecessary analyses affect the individual and society as a result of the economic and social burden incurred. It is important to assess patients from a multidisciplinary and biopsychosocial perspective and to increase the number of adequately trained staff in order to offer quality healthcare.

**Keywords:** Aging; elderly; home care.

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Data from the World Health Organization indicate that the global average life expectancy in 2015 was 71.4 years (men: 69.1, women: 73.7 years).<sup>[1]</sup> The incidence of chronic disease increases with a longer average life expectancy. According to the Centers for Disease Control and Prevention (CDC) in the USA, approximately 80% of all people aged >65 years have at least 1 chronic condition, and 50% have at least 2.<sup>[2]</sup>

The risk of disease increases with age, and common, progressive disorders are often seen. Greater life expectancy has led to new concerns surrounding the issues of longevity and the quality of healthy years lived, and the development of novel, preventive health policies.

It is well known that genetic and environmental factors affect many chronic diseases. For example, the nutritional state of children has been linked to diabetes mellitus (DM), which leads to increased morbidity and mortality. Therefore, preventive health services should be offered early.<sup>[3]</sup> In addition, the diagnostic process, treatment, and health-care services are also important after the development of disease.

Aging and its consequences may restrict the daily activities of an individual and increase the need for healthcare services. Offering home health services to elderly patients who may have difficulty accessing healthcare institutions addresses the principle of providing equal benefit of public health services. Home care units provide healthcare and follow-up services as directed by the patient's physician to meet medical needs such as rehabilitation, physiotherapy, and psychological therapy in the home environment. This type of home care can sometimes replace nursing home care, and decrease or defer the need for in-patient care.<sup>[4]</sup> A significant and important part of home health services has been assumed by hospital-affiliated home care units.<sup>[5]</sup>

According to 2014 data published by the Turkish Statistical Institute, 450.031 individuals received home health services in Turkey, and 2015 data from the Public Health Institution of Turkey indicated that 946 home care units were actively offering health services. The home health care unit of our hospital offers its services in affiliation with the family medicine clinic. This study is an evaluation of the characteristics of the patients who received health services from the unit during 2016 and the services offered.

## Methods

The data of patients who were visited by the home care unit affiliated with the family medicine clinic of our hospital between January 1 and December 31, 2016 were obtained through a retrospective review of patient files.

Age, gender, diagnosis, frequency of home care visits, re-

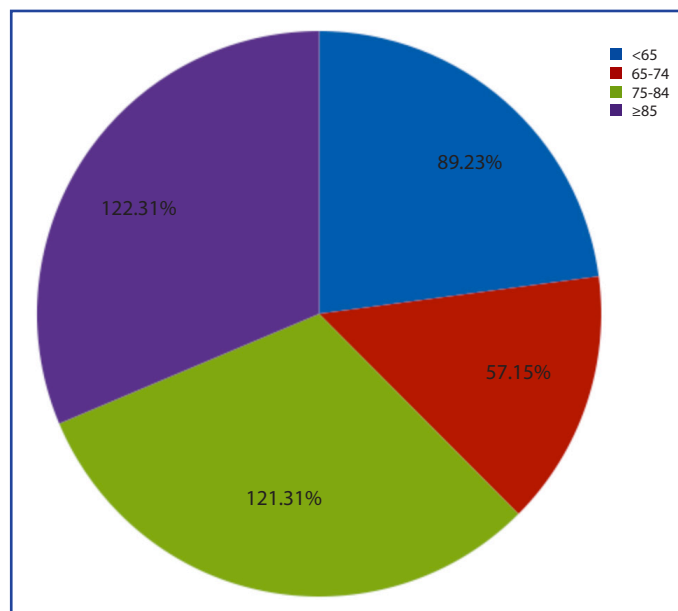
quested consultations and tests, use of emergency services, and the data of patients who died during the study period were recorded. The diagnoses of the patients were evaluated and the patients were grouped in categories: neurological diseases, cardiovascular diseases, endocrinological diseases, and other (for patients with more than 1 diagnosis, the disease for which the patient was receiving home care was accepted as the main diagnosis). The requests for a blood count, hemogram, complete urinalysis, biochemical tests (glucose, urea, creatinine, aspartate aminotransferase, alanine aminotransferase, electrolytes, cholesterol panel), and hormone tests (thyroid-stimulating hormone, free thyroxine) were counted.

Frequencies and mean values were calculated using statistical software. A chi-square test, t-test, and correlation analyses were performed.  $P < 0.05$  was accepted as the level of statistical significance.

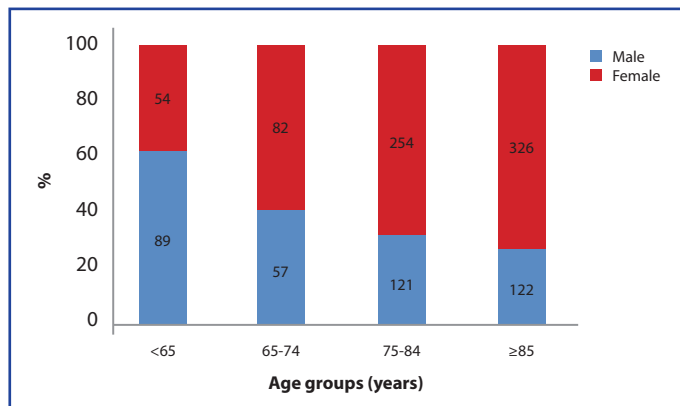
## Results

The home care unit provided health services to 1105 patients during the year 2016. There were 716 (64.8%) female and 389 (35.2%) male patients, with a mean age of  $78.24 \pm 15.43$  years. The mean age of the female and male patients was  $80.65 \pm 13.47$  years and  $73.79 \pm 17.68$  years, respectively. During the study period, patients aged >85 years were the group that received home health services most frequently ( $n=448$ , 40.5%), and 87.1% of the patients served were older than 65 years of age (Fig. 1).

A statistically significant correlation existed between gender and age group ( $p=0.000$ ) (Fig. 2). Among the patients



**Figure 1.** Distribution of patients receiving home care services according to age groups (years).



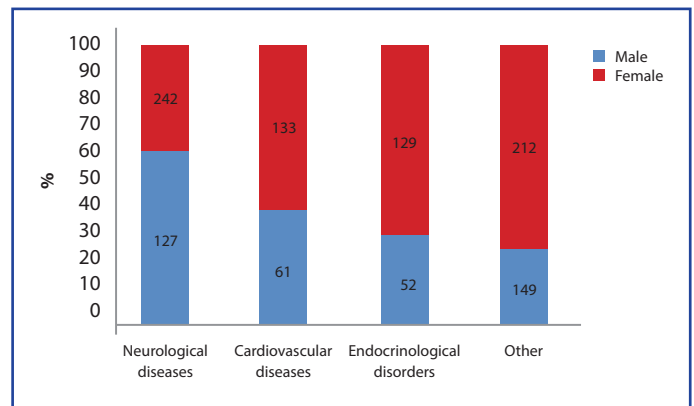
**Figure 2.** Distribution of gender by age group.

aged ≥65 years, there were more females than males. Alzheimer’s disease was the most frequently encountered diagnosis. Alzheimer’s disease was seen in 33.5% of the female patients and 31.9% of the male patients. The next most seen diagnoses were essential hypertension and DM. Patients with neurological diseases were visited by home health services most often (n=554, 50.1%), followed by those with cardiovascular diseases and endocrinological disorders. A statistically significant correlation was detected between gender and diagnosis-related groups (p=0.010). There were more female patients in every disease group (Fig. 3). When correlations between age group (aged <65 years and ≥65 years) and diagnosis-related groups were investigated, Alzheimer’s disease was detected most frequently in patients older than 65 years (p=0.000).

During the year, a patient was visited an average of 6.54 times (median: 4 times). A total of 624 (56.5%) patients received health services at home on more than ≥4 occasions. No correlation between gender and the number of visits was found (p=0.699). However, a statistically significant correlation was observed between the age of the patient and the number of visits (r=0.63; p=0.037). Similarly, a statistically significant correlation was determined between ≥4 visits and age (p=0.00). The number of visits from the home care unit increased with the age of the patient.

There was no significant correlation between the patients who were visited ≥4 times, use of emergency services, and mortality rate (p=0.141). However, a significant correlation was detected between the number of visits and the diagnosis-related groups (p=0.00). Patients with Alzheimer’s disease were visited ≤3 times, while patients diagnosed with essential hypertension and endocrinological disorders were visited ≥4 times.

A whole blood count was requested for 83% (n=917) of the patients, a biochemical test for 63.5% (n=702), a complete urinalysis for 34.9% (n=386), and a hormonal assay for 65.1% (n=719). Tests were most frequently ordered for



**Figure 3.** Distribution of gender by disease group.

patients with a diagnosis of essential hypertension or an endocrinological disorder.

In the study group, 432 (39.3%) patients accessed emergency services at least once (Table 1). A correlation was not detected between age group, gender of the patient,

**Table 1.** Distribution of emergency services use according to age and gender

	Emergency services use		No use of emergency services		p
	N	%	N	%	
Gender					
Female	276	63.4	440	65.7	0.450
Male	159	36.6	230	34.3	
Age groups (years)					
<65	61	14	82	12.2	0.175
65-74	56	12.8	83	12.4	
75-84	159	36.6	216	32.2	
≥85	159	36.6	289	43.2	
Deceased	45	10.3	69	10.3	0.980
Survived	390	89.7	601	89.7	

**Table 2.** Distribution of survival patients according to age, gender, and diagnosis

	Deceased		Survived		p
	N	%	N	%	
Gender					
Female	72	10.9	648	89.1	0.699
Male	49	10.8	347	88.2	
Age groups (years)					
<65	16	11.2	127	12.8	0.576
65-74	12	10.5	127	12.8	
75-84	34	29.8	341	34.4	
≥85	52	45.6	398	40	
Diagnoses					
Alzheimer’s disease	45	39.5	509	51.4	0.031
Essential hypertension	38	33.3	197	19.9	
Endocrinological disease	16	14	168	17	
Other	15	13.2	117	10.7	

and need for emergency services ( $p=0.175$ ;  $p=0.450$ ). A significant correlation was not found between the use of emergency services and the number of patients who died ( $p=0.980$ ).

No consultation was requested for 24 (2.2%) patients. Neurology clinic consultations were the most often requested ( $n=6$ , 0.25%). A significant correlation was not detected between age, gender, and the number of consultations requested. ( $p=0.198$ ;  $p=0.290$ ).

A total of 114 (10.4%) patients died during follow-up. As illustrated in Table 2, no significant correlation was detected between gender, age groups, and mortality rates ( $p=0.699$ ;  $p=0.576$ ). In an examination of mortality and disease groups, the diagnosis of Alzheimer's disease was statistically significantly correlated with mortality (39.5%,  $n=45$ ;  $p=0.031$ ). Among the entire group, those with Alzheimer's disease who died represented 8.1%.

## Discussion

Home care units provide health services to individuals of all ages who are in need of treatment. Our home care unit provided health services for 1105 individuals during the year 2016. In 1998, 83% of the home healthcare patients in Austria were aged  $\geq 65$  years, 83% were 65 years of age or more in Germany, and 63% of the patients were aged  $\geq 65$  years in the USA.<sup>[6]</sup> A 2015 study conducted in Turkey revealed that 88.1% of the patients who had benefited from home health services were aged  $\geq 65$  years.<sup>[7]</sup>

In our study, 87.1% of the patients were aged  $\geq 65$  years. This is likely related to an increased need for care provided at home that can result from a decreasing ability to perform daily activities over time.

In a study performed in Croatia, the median age of the patients who received home healthcare services was 78.4 years (range: 48-95 years).<sup>[8]</sup> Similarly, in our study the mean age was  $78.31 \pm 15.28$  years. The elderly are more frequently in need of medical, social, and economic support; medical care; and monitoring.<sup>[9]</sup> In our study, the oldest age group, those 85 years of age or more (40.5%,  $n=448$ ) were the most frequently served by our home care unit. With the physiological and anatomical changes that accompany the aging process, it often becomes difficult to complete many tasks that were once accomplished with ease.

Based on 2016 data of the Turkish Statistical Institute, those 65 years of age and older constituted 8.3% of the overall population, and 56.1% were women. Based on the results of a study of patients aged  $\geq 65$  years who received home healthcare services in Turkey's Burdur province, 67.6% were female.<sup>[10]</sup> A study from Kırıkkale province published in 2016 reported that 57.9% of home healthcare service

patients were female.<sup>[11]</sup> In our study, 64.8% of the patients were women. Since the life expectancy of women is greater than that of men, female patients are more frequently in need of home healthcare services. According to 2016 Turkish Statistical Institute data, the life expectancy at birth in Turkey is 78 years for the total population, 75.3 years for men, and 80.7 years for women.

In a study performed in Jordan in 2014, the authors found that most frequently, patients with cardiac diseases (41.5%) required home health services.<sup>[12]</sup> In our study, patients with Alzheimer's disease ranked first, followed by essential hypertension and endocrinological disorders. Regional differences and the presence of more than one disease in these patients may explain these findings.

Alzheimer's disease is the most common cause of dementia.<sup>[13]</sup> Alzheimer's disease is characterized by mental and memory dysfunction, personality changes, and deficits in verbal and motor skills during the terminal stage of the disease that may make the individual completely dependent on others. Therefore, patients with Alzheimer's disease often need home healthcare services. Aging is the most important risk factor for Alzheimer's disease.<sup>[14]</sup> The incidence rate of Alzheimer's disease is greater in individuals aged  $\geq 65$  years and in the female population.<sup>[15]</sup> Similarly, in our study, the diagnosis of Alzheimer's disease was statistically significant when the diagnoses of patients younger than 65 were compared with those  $\geq 65$  years ( $p=0.000$ ) and we found a statistically significantly higher incidence of Alzheimer's disease in patients older than 65 years of age and in female patients.

Turaman<sup>[9]</sup> found that 40.4% of the study patients had received home healthcare services  $\geq 4$  times, and 44.1% of the patients indicated that the home care services decreased the rate of hospital admissions. In the present study, over the course of 1 year, a patient was visited an average of 6.58 times. In all, 624 (56.5%) patients were visited  $\geq 4$  times. A comparison revealed that the frequency distribution of patients who consulted emergency services was 6.74 while it was 6.41 for those who did not. A statistically significant correlation was not detected between the use of emergency services and the number of home care visits. No statistically significant correlation was detected between  $\geq 4$  visits by the home care unit, the need for emergency services, and mortality; however, a relationship was noted between diagnoses ( $p=0.000$ ). Patients with essential hypertension or endocrinological disorders were visited more frequently than patients with other diagnoses. Physical examinations and periodic tests are important in the follow-up of patients with essential hypertension and endocrinological disorders, and furthermore, abnormal or erroneous test re-

sults require additional blood samples. These factors may contribute to more visits to these patients.

Today, with the progress of technology, patients and their relatives have greater access to information through internet and television, and in combination with greater access to health services, there has been an increase in unnecessary requests for analyses and tests. The results of a study performed in the Turkish Republic of Northern Cyprus indicated that 34% of urban patients were visited by home health services for glycemic control, and 24% of the patients living in rural areas were visited for blood samples (14). In our study, a whole blood count was requested for 917 patients (83%), a biochemical test for 702 (63.5%), a complete urinalysis for 386 (34.9%), and a hormonal assay for 719 (65.1%). The greatest number of tests was requested for patients with essential hypertension and endocrinological disorders. We think that the number of requests was related to follow-up procedures that require more frequent testing, as well as the fact that many patients had more than 1 chronic disease.

Among chronic diseases, cardiovascular diseases are the leading cause of mortality in Turkey and the world.<sup>[16]</sup> When we compared the mortality rate and the diagnosis-related groups, the presence of Alzheimer's disease was statistically significant (39.5%, n=45; p=0.031). Mortality statistics of the elderly in Cyprus indicated that in 2011 6.500 patients with Alzheimer's disease died, while in 2015 this figure rose to 11.997 patients. In other words, Alzheimer's disease constituted 2.9% of all-cause mortality in 2011 and increased to 4.3% in 2015.<sup>[17]</sup> In the present study, the mortality rate of patients with Alzheimer's disease represented 8.1% of our study population. This larger percentage may be attributed to the relatively larger number of patients with Alzheimer's disease in the home care group compared with the overall population.

## Conclusion

Home healthcare services is and will continue to be an important field, given the aging population. Home health services are most often requested for patients older than 65 years, and those with neurological diseases. Due to a greater life expectancy, there are typically more female patients than male. In our study, more tests and examinations were requested for patients with the diagnoses of essential hypertension and endocrinological disorders, and these patients also were more frequently visited by home care units. The presence of more than 1 disease in elderly patients increases the number of requests for biochemical analysis, and often leads to recurring and superfluous laboratory tests. These unnecessary requests for laboratory

tests adversely affect both the individuals and society from both an economic and a social perspective.

Patients should be evaluated from a multidisciplinary and biopsychosocial perspective in order to be able to provide high quality healthcare services to them. The time spent with patients and the extent of services provided should be increased.

Due to aging in the community and the growing number of patients, increasing the number of home healthcare units and the number of trained staff to serve them will increase the quality of healthcare services.

## Disclosures

**Ethics Committee Approval:** Retrospective study.

**Peer-review:** Externally peer-reviewed.

**Conflict of Interest:** None declared.

**Authorship contributions:** Concept – G.Z.O.; Design – D.T.; Supervision – D.T.; Materials – G.Z.O.; Data collection &/or processing – G.Z.O.; Analysis and/or interpretation – G.Z.O.; Literature search – G.Z.O.; Writing – G.Z.O.; Critical review – D.T.

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