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EVALUATION OF THE 90-DAY RE-ADMISSION RATE OF PATIENTS ADMITTED TO INTERNAL CLINICS
DÂHİLİ KLİNİKLERE YATAN HASTALARIN 90 GÜN İÇİNDE YENİDEN YATIŞ ORANLARININ
DEĞERLENDİRİLMESİ

Hatice ESEN KOÇ¹¹Department of R&D, Antalya Training and Research Hospital, Antalya, Türkiye**ABSTRACT**

Patients admitted to internal clinics frequently present with one or more chronic diseases, which significantly elevates the risk of hospital readmission among patients aged 65 and above. Frequent readmissions have become a significant challenge for patients with chronic conditions admitted to internal medicine departments. The objective of this study was to ascertain the incidence of hospitalization within a 90-day period among patients aged 65 and above who had received inpatient healthcare services at an internal clinic within a training and research hospital. The study data comprises the records of patients aged 65 and over who were hospitalized in the internal clinics of the aforementioned hospital between 1 January 2021 and 31 December 2021. The mean age of the sample was 72.34±6.24 years, with 39.8% of the subjects being female and 60.2% male. The highest rate of readmission to the hospital was observed during the first spring period, with a rate of 31.40%. The mean length of stay for elderly individuals admitted to the hospital for readmission was 32.72 days. The rate of readmission within 90 days among geriatric patients hospitalized in internal clinics is 45.57%. It can be stated that one in every two geriatric individuals was readmitted to the hospital within the first three months following discharge. In this context, it is crucial to develop and implement effective policies to reduce hospital readmission rates. Among the indicators monitored within the scope of quality standards in health care, the rate of hospitalization within 30 days should be monitored as an indicator, and improvement studies should be initiated based on the results.

Keywords: Geriatric health services, hospital readmissions, internal medicine.

ÖZ

Dahili kliniklere yatırılan hastaların genellikle bir veya daha fazla kronik hastalığı vardır, bu da 65 yaş üstü hastalarda hastaneye tekrar yatış riskinin artmasına neden olur. Sık tekrar yatışlar, dahiliye bölümlerinde yatan kronik hastalar için önemli bir sorun haline gelmiştir. Bu çalışmada, bir eğitim ve araştırma hastanesinin dahiliye kliniklerinde yatarak sağlık hizmeti alan 65 yaş ve üzeri hastaların 90 gün içinde hastaneye yatış oranlarının ortaya konulması amaçlanmıştır. Çalışma verileri, 01.01.2021 ile 31.12.2021 tarihleri arasında değerlendirilen hastanenin dahili kliniklerinde yatmış 65 yaş ve üzeri hastaların kayıtlarından oluşmaktadır. Çalışma grubunun yaş ortalaması 72.34±6.24 yıl olup % 39.8'i kadın, %60.2'si erkektir. En yüksek hastaneye tekrar yatış oranı (%31.40) ilk bahar döneminde gerçekleşmiştir. Yaşlı bireyler hastaneye ortalama 32.72 gün içinde tekrar yatış için kabul edilmiştir. Dahili kliniklerde yatan geriatric hastalarda 90 gün içinde tekrar hastaneye yatış oranı %45.57'dir. Her iki geriatric bireyden birinin taburcu olduktan sonraki ilk 3 ay içinde tekrar hastaneye yatırıldığı söylenebilir. Bu bağlamda hastaneye tekrar yatış oranlarının azaltılmasına yönelik politikaların dikkatle belirlenmesi önem arz etmektedir. Sağlıkta kalite standartları kapsamında izlenen göstergeler arasında "30 gün içinde hastaneye yatış oranı" bir gösterge olarak takip edilmeli ve sonuçlara göre iyileştirme çalışmalarının başlatılması önerilmektedir.

Anahtar kelimeler: Geriatrik sağlık hizmetleri, hastane yeniden başvuruları, iç hastalıkları.

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INTRODUCTION

The World Health Organization (WHO) defines old age as beginning at the age of 65 years and above.¹ The proportion of the elderly population in the total population exceeding 10.0% is the primary indicator of population ageing.² The proportion of the elderly population is increasing in direct proportion to improvements in living standards worldwide, technological developments and the prolongation of the average life span. It is projected that the proportion of the global elderly population will reach approximately 22% by 2050.³

In Türkiye, the proportion of the elderly population is increasing at a rapid rate on a daily basis. The data published by Turkish Statistical Institute (TUIK) substantiates the assertion that a demographic transformation is occurring in the population structure of our country. The proportion of the elderly population in the total population is projected to reach 8.3% in 2016, 9.7% in 2021, 11.0% in 2025, 12.9% in 2030, and 25.6% in 2080.²

The process of aging is characterized by a series of biochemical, physiological, social and lifestyle changes that collectively increase susceptibility to a range of diseases. The prevalence of chronic diseases rises with age.⁴ The demographic shift towards an aging population presents a number of challenges, underscoring the need for enhanced social and medical services. It is evident that this demand will continue to grow in tandem with the aging process.⁵ The elderly population's growing share of the overall population will undoubtedly lead to an increased utilization of health services. This is due to the fact that this demographic, which is prone to chronic illnesses, will have more frequent interactions with healthcare professionals.⁶ Consequently, this period is characterized by an increased utilization of hospitalized health services by the elderly population.⁷ It is established that the rate of hospitalization among the geriatric population (aged 65 and above) is three times higher than that of the younger population (aged 16-64).^{8,9} The reasons for hospitalization vary depending on the individual patient and the disease in question.¹⁰ A number of studies have demonstrated that the underlying causes and duration of hospitalization are influenced by a number of factors, including age, gender, the presence of concomitant disease, the geographical region of the hospital, the hospital bed capacity, the hospital property status, the season of hospitalization, the type of hospital service, and the hospital location.¹¹ In studies conducted, the rate of readmission within one month after discharge from the hospital ranges from 7.3% to 32.7%. There are studies in the literature that deal with different topics, including all readmissions, unscheduled readmissions, and preventable readmissions.¹² It is presumed that patients who are readmitted within a few days of discharge, including for reasons other than the initial admission, may have received inadequate treatment and care during their previous hospitalization. It is therefore essential to identify these factors in order to facilitate the delivery of improved care.¹³

In the process of increasing demographic change in our country, there is a need for studies to be carried out in the elderly patient group in order to determine the hospitalization rates of the This group who are provided

with health care services in the hospital and to make the necessary policies and improvement studies. The objective of this study is to ascertain the incidence of hospitalization within a 90-day period among patients aged 65 and above who receive inpatient healthcare services at internal clinics within the hospital.

MATERIALS AND METHODS

Design and setting

This study was planned as a single-centered, retrospective, descriptive and cross-sectional research. The population of the research consists of patients aged 65 years and older who received health care services in the internal clinics of Antalya Training and Research Hospital in 2021. The data used in the research (patient age, clinic, request for consultation, outcome of the disease) were obtained from the hospital information management system (HIMS). Data of patients aged 65 and over who were hospitalized between 01.01.2021 and 31.12.2021 were included in the study. In determining the rate of hospitalization of the patients, all hospitalizations of a patient within 90 days were included instead of a single patient. Exclusion criteria; the data of patients aged under 65 years old were determined as surgical clinic, mental health clinic, patients hospitalized in intensive care units and patients who were hospitalized daily. Mental health clinics patients need to be given special consideration. This group of patients is hospitalized in the clinic for a minimum of three weeks, and readmission rates vary seasonally due to exacerbations and other reasons. Additionally, the average length of stay is quite long. Because of these factors, psychiatric patients were excluded from the study.

Statistical analyses

Statistical analyzes of the data obtained in the study were performed using the SPSS 25 (Statistical Package for Social Sciences) program. Descriptive statistics were presented as mean±standard deviation, median, median (minimum-maximum), categorical data as percentage (%) for continuous variables. Normality distribution of data for statistical test selection Kolmogorov-Smirnov evaluated with the test. Mann-Whitney U test was applied since the comparison of two independent groups did not show that the data were not normally distributed. Since the data were not normally distributed in comparisons of three or more independent groups, analyses were performed using the Kruskal Wallis test and post hoc dunn's test.

RESULTS

The average age of patients over 65 years of age who participated in the study is 72.34. 39.8% of the elderly are female and 60.2% are men. 69.5% of the elderly are in the 65-74 age range, 24.7% are 75-84 years old, and 5.7% are 85 years old and over. When the clinics where elderly individuals receive inpatient treatment are examined, the clinics with the highest number of hospitalizations are respectively; Infection clinic was 27%, medical oncology 22.3%, internal medicine clinic 11.2% and nephrology clinic 10.4%. The vast majority (65.1%) of the patients who received inpatient treatment were discharged. Patients over 65 were admitted to the same clinic in an average of 32.72 days. Consultation was not requested from 66% of inpatients, while consultation

was requested from 34%. The highest rate of hospitalization is in the spring period with 31.40%, and the lowest rate is in the autumn period with 18.38% (Table 1). In 2021, a total of 7499 patients aged 65 and over received inpatient treatment in internal branches, and 3417 of these patients were hospitalized within 90 days, and the rate of readmission to internal clinics within 90 days was found to be 45.57%. When examined on a clinical basis, the clinics with the highest re-hospitalization rate are respectively; infectious diseases and clinical microbiology (79.30%), medical oncology (67.76%), nephrology (62.33%), internal medicine (46.42%), rheumatology (40.00%), pulmonary diseases (39.71%) and gastroenterology (35.57%) clinics (Table 2).

When the distribution of consultations requested from other branches to inpatients is examined; Consultation

was requested from the algology and anesthesia clinic for 27.54%, infectious diseases and clinical microbiology clinic for 16.01%, cardiology clinic for 9.47%, and 7.14% for nutritional evaluation (Table 3).

It was examined whether there was a difference between age groups and readmission, and it was determined that there was a statistically significant difference ($p \leq 0.005$) (Table 4).

Pairwise comparisons were made between age groups in order to determine from which age group the difference between age group and readmission arises. When the data obtained were examined, it was found that the difference was caused by the 65-74 age group and the 85+ group, and the 65-74 age group and the 75-84 age group ($p < 0.001$, Table 5).

Table 1. Descriptive Data

		avg./n	%	
Age	Mean±Sd	72.34	6.253	
	Median(Min-Max)	71	65-93	
	Age 65-74	2376	69.5	
	Age 75-84	845	24.7	
	85+	196	5.7	
Time between two stays (days ?)	Mean±Ss	32.72	23.964	
	Median(Min-Max)	28	32874.0	
Gender	Male	2057	60.2	
	Female	1360	39.8	
Clinics	Internal medicine	382	11.2	
	Neurology	223	6.5	
	Rheumatology	6	0.2	
	Medical Oncology	761	22.3	
	Endocrinology	5	0.1	
	Infection Disease. and Clin. micr.	922	27.0	
	Physiotherapy	7	0.2	
	Gastroenterology	223	6.5	
	Chest Diseases	249	7.3	
	Hematology	145	4.2	
	Cardiology	137	4.0	
	Nephrology	357	10.4	
	Conclusion	Transfer to Another Hospital	41	1.2
		No change	555	16.2
Was Discharged as a State		2226	65.1	
Partially Healed		265	7.8	
Salah		136	4.0	
Discharged with Healing		150	4.4	
Lost his life		44	1.3	
Consultation Request Status	There is a consultation	1162	34%	
	No consultation	2255	66%	
Seasonal Period	Autumn Term	628	18.38	
	Spring Term	1073	31.40	
	Summer Term	779	22.80	
	Winter Term	937	27.42	
Total		3417	100.00	

avg.: Average sd: standard deviation Min: minimum max: Maximum

Table 2. Re-hospitalization Rate of Patients aged 65 and over

Clinics	65+ Number of Inpatients	Number of inpatient readmissions within 90 days: 65+	%*
Internal medicine	823	382	46.42
Neurology	867	260	29.99
Rheumatology	15	6	40.00
Medical Oncology	1123	761	67.76
Endocrinology	47	5	10.64
Infection Disease. and Clin. micr.	1116	885	79.30
Physiotherapy	59	7	11.86
Gastroenterology	627	223	35.57
Chest Diseases	627	249	39.71
Hematology	688	145	21.08
Cardiology	937	137	14.62
Nephrology	570	357	62.63
Total	7499	3417	45.57

*Line Percentage

Table 3. Distribution of Inpatients aged 65 and over by Units for which Consultation is Requested

Clinics	n	%*
Algology+Anesthesia	320	27.54
Infection Disease. and Clin. Micr.	186	16.01
Cardiology	110	9.47
Nutrition	83	7.14
Chest Diseases	49	4.22
Eye Diseases	42	3.61
Neurology	33	2.84
Brain Surgery	5	0.43
Skin	3	0.26
Internal Medicine	11	0.95
Endocrinology	7	0.60
Physiotherapy	23	1.98
Gastroenterology	11	0.95
Gastroenterology Surgery	3	0.26
General Surgery	15	1.29
Interventional radiology	23	1.98
Chest Surgery	6	0.52
Hematology	29	2.50
Gynecological Oncology Surgery	2	0.17
Ear Nose Throat Diseases (ENT)	9	0.77
Gynecology and Obstetrics	15	1.29
Cardiovascular Surgery	25	2.15
Nephrology	29	2.50
Orthopedics and Traumatology	15	1.29
Plastic, Reconstructive and Aesthetic Surgery	7	0.60
Psychiatry	25	2.15
Medical Oncology	12	1.03
Rheumatology	9	0.77
Urology	50	4.30
Other	5	0.43
Total	1162	100.00

*Column Percentages

Table 4. The relationship between age groups and readmission

Variable	N	Rank Average	df	x ²	p
65-74 years	2376	1752.40	2	17.781*	.000
75-84 years	845	1634.07			
85+	196	1505.96			

* Kruskal Wallis Testdf: Degree of freedom

Table 5. Significant Difference Distribution by Age Group (Post hoc test)

Variables	N	Rank Average	P	Significant Difference
65-74 years	2376	1300.56	.001	1-3
85+	196	1116.08		
65-74 years	2376	1640.34	.003	1-2
75-84 years	845	1528.51		
75-84 years	845	528.57	.092	
85+	196	488.38		

1: 65-74 years 2: 75-84 years 3: 85+

DISCUSSION

In the study, the demographic characteristics of patients aged 65 and over who were treated as inpatients, including the rate of readmission, the clinics they were admitted to, the consultation status requested during the hospitalisation period and the outcome of the treatment.

The study found that the average age of inpatients aged 65 and over was 72.34 years. The majority of inpatients were aged between 65-74. In the study, the mean age of the patients aged 65-93 years and those aged 65 and over who received inpatient treatment was 72.34±6.25 years. In a study, the age of the patients ranged from 65 to 94, with a mean age of 74.0±7.1.¹⁴ In another study, it was reported that hospital readmissions increase with increasing age (18.4% in patients aged 80 and over).¹⁵ According to TÜİK 2021 data, 64.7% of the elderly population is in the 65-74 age group, 27.3% is in the 75-84 age group, and 8.0% is in the 85 and over age group.² Considering the study population, it is similar to the population age distribution of Türkiye. The gender distribution of the study population is not similar to the population of our country. The reason for this was thought to be the social structure and population characteristics of the Mediterranean region. When the proportion of the elderly population is female, 6.2% is in the 65-74 age range, 2.50% is in the 75-84 age range, and 0.64% is in the 85+ age range.¹⁶ The population of Antalya province is similar to our study data in terms of both gender and age range.

In a study conducted; It has been reported that 48.67% of the patients aged 65 and over hospitalized in the internal medicine departments of Hacettepe University Hospital were female and 51.33% male.¹⁴ In another study, a total of 370 inpatients over the age of 65 were included, and it was determined that 150 of the patients were male and 220 were female.³ In the literature, there are similar results with regard to gender in the hospitalisation of older people, as well as different results. The study found that the rate of re-admission to hospital was higher for male patients.

In the study, the highest rate of hospitalization was in the spring period with 31.40%, and the lowest rate was in the autumn period with 18.38%. There are results in the literature that are compatible with our study.¹¹

In the study, the rate of readmission to internal clinics within 90 days was found to be 45.57%. In the study, it was stated that the hospitalization rates of individuals aged 65 and over are three times higher than those aged 16-64.⁸ One study reported that 1 in 5 people were hospitalized again within 30 days of discharge.¹⁷ In another study; It has been reported that patients came back to the hospital at least once within 90 days after discharge

and the rate of readmission was 58.9% in a 2-year period.¹⁸ In a study examining readmissions within 30 and 90 days of acute ischemic stroke patients, it was reported that 7.3% of patients had readmissions within 30 days and 13.7% had readmissions within 90 days.¹⁹ In a study of patients experiencing homelessness, the rate of readmission within 90 days of discharge from a general internal medicine unit was 27.1%.⁹ In a study of patients with cirrhosis, the hospitalization rates of 30, 60, and 90 days after discharge were examined and reported to be 16%, 23%, and 27%, respectively.²⁰ It was reported that 12.4% of internal medicine patients were re-hospitalized within 30 days.²¹ In the study, the rate of readmission within 30 days after discharge was 15.3%.¹³ A study reported that the rate of readmission to hospital within 90 days was 19%.²² The rates of readmission in patients admitted to internal medicine clinics of six US academic medical centers were reported to be 17.55% and 22.8%.¹³ The readmission rates of patients with chronic renal failure at 30 and 90 days were examined and found to be 24% and 40%, respectively.²³ In this study, the rate of readmission in the nephrology clinic was 62.63%, and the rate of readmission in the gastroenterology clinic was 35.57%. It is thought that the differences in the results may be due to the fact that other studies were conducted in specific diseases, changes in sample numbers and regional differences. Cardiac, respiratory, digestive system, musculoskeletal system, nervous system, genito-urinary system, immune system, senses and mood changes occur with aging, and the incidence of chronic diseases and more comorbidities increases.^{5,7}

In this study, it was determined that there was a relationship between age and hospital readmission within 90 days. In a study, it was stated that the majority (68.8%) of rehospitalized patients were 80 years or older.¹⁸

An issue that should be emphasized in our study is the high rates of both hospitalization and re-admission to clinics with chronic diseases. It is well known that as people get older, they have more co-morbid chronic conditions and, as a result, old age is a time when inpatient treatment services are highly beneficial.⁷ When the literature is examined; It was stated that patients applied for cardiovascular, gastrointestinal, endocrinological reasons and respiratory system diseases.^{3,14,24} The reason for the high rate of admission to the Infectious Diseases and Clinical Microbiology clinic is thought to be an important result of the ongoing pandemic process. In a study, the rate of readmission due to infectious complications was reported as 32%.²⁵

Consultation in other branches was also requested from elderly individuals who received inpatient treatment

during their hospitalization. Considering these results, it can be said that these individuals have more than one chronic disease. One of the important findings obtained in our study is the request for consultation for nutritional evaluation at a rate of 7.14%. In a study similar to our study findings, 6.3% of nutritional disorders were found.⁶ In a systematic study, the rates of readmission within 30 and 90 days after discharge of patients aged 65 and over were examined. It has been explained that malnutrition is a risk that increases hospital readmission.¹² In general, the feeling of hunger and eating habits decrease in elderly individuals and nutritional disorders occur. With aging, adipose tissue increases, lean body mass decreases, the body's total water amount and basal metabolic rate decrease. While calorie requirement decreases with age, nutrients such as vitamin B12, which require acid for absorption, are less absorbed. Nutritional disorders in older people are a very important health problem that should not be overlooked.²⁶ Patients hospitalized in internal clinics are usually accompanied by one or more chronic diseases. As a result, these patients use multiple drugs, are often functionally dependent on their self-care, resulting in an increased risk of hospital readmission in patients over 65 years of age.²¹ Frequent readmissions have become a major problem for chronically hospitalized patients.¹⁸ Hospital readmission shortly after discharge is a common occurrence for internal medicine clinics.²² It should develop tools for local policymakers to help identify priority areas of action, design action plans, and monitor and evaluate age-friendly policies.²⁷ In this context, the phrase "services and policies for the aging population will be developed based on data" in the Eleventh Development Plan in our country.²⁸

CONCLUSION

This study provides an overview of hospital readmission rates for people aged 65 and over. As the elderly population grows, so does the importance of health care for the elderly. The length of stay in hospital is also an important determinant of the health care costs associated with hospital care. There are many reasons for being readmitted to hospital. For many patients with different diseases and different conditions, it is not possible to talk about the rate of hospitalization within 30 and/or 90 days. In this respect, it is important to carefully define policies aimed at reducing hospital readmission rates. This study shows that patients are readmitted to hospital within an average of one month. For this reason, among the indicators monitored within the framework of quality standards in health care, "the rate of hospital readmissions within 30 days" can be followed as an indicator. Sub-indicators such as readmission rate by clinic, age distribution, diagnosis-based, etc. can be monitored.

This study has some limitations. The results of the study cannot be generalized to the whole country, since the study was cross-sectional and the data were obtained from only one training and research hospital and covered only one year. The study did not investigate whether patients received outpatient or inpatient treatment from other health institutions between hospitalizations. Due to the lack of a unified query system under

the Ministry of Health, access to study data is only possible when requested by a private hospital, family physician, or a hospital using a different HIMS company.

Ethics Committee Approval: This study has been approved by the Health Sciences University Antalya Training and Research Hospital Clinical Research Ethics Committee (approval number 23/13, dated 22/12/2022).

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