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Research Article

Clinical Characteristics of Geriatric Patients Admitted to the Emergency Department and Evaluation According to Age Groups

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ABSTRACT

Objective: To evaluate the demographic and clinical characteristics, reasons for admission, triage distribution, consultation requests, and hospitalization rates of geriatric patients presenting to a tertiary emergency department, and to examine the associations between age groups and emergency department utilization patterns and outcomes.

Materials and Methods: This retrospective and descriptive study was conducted among patients aged 65 years and older who presented to the emergency department of Mengücek Gazi Training and Research Hospital between July 1, 2024, and June 30, 2025. Data on demographic characteristics, triage categories, reasons for admission, consultation requests, hospitalization status, emergency department outcomes, and repeat visits were obtained from the hospital information management system. The data were analyzed using descriptive statistical methods.

Results: A total of 18,269 geriatric patients were included in the study. The mean age was 74.0 ± 7.2 years, and 54.5% of the patients were female. The highest proportion of admissions was observed in the 65-74 age group. Hospitalization occurred in 11.4% of cases. As age increased, ambulance admissions, repeat emergency department visits, and hospitalization rates increased significantly ($P < 0.05$). The most common reasons for admission were musculoskeletal, respiratory, and cardiovascular diseases.

Conclusion: This study demonstrates that geriatric patients presenting to the emergency department exhibit distinct clinical and utilization characteristics by age group. The findings indicate that patients in older age groups require more complex clinical evaluation and tailored care during management in the emergency department.

Keywords: Geriatric assessment, emergency services, age groups

INTRODUCTION

According to projections by the World Health Organization (WHO), the global elderly population is expected to increase markedly in the coming years, accompanied by a substantial rise in the utilization of health care services.[1] Similarly, population projections by the Turkish Statistical Institute estimate that the proportion of the elderly population in Türkiye will reach 13.5% in 2030, 17.9% in 2040, 27.0% in 2060, and 33.4% in 2080.[2] The rapid growth of the elderly population at global and national levels is anticipated to increasingly affect the provision of health care services.

In previous studies conducted at different centers, individuals aged 65 years and older have been reported to constitute between 10.1% and 17.4% of all emergency department admissions.[3,4] With the expansion of the elderly population, the growing number of emergency department visits has led to increased patient turnover and resource utilization, resulting in

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a greater workload for emergency services.[5] Moreover, discharge rates from the emergency department among geriatric patients have been reported to range from 79.4% to 92.4% in various studies.[3-5] These findings suggest potential inappropriate use of emergency departments and highlight the need for new strategies regarding the care, follow-up, and management of elderly patients.[5]

As the proportion of elderly individuals in the community continues to rise, it has become essential to address in greater detail the health-care needs specific to this age group and to reorganize health-care services accordingly. Age-related declines in physiological and psychosocial reserves increase vulnerability to diseases and impair older adults' ability to adapt to changes in daily life. The presence of multiple comorbidities and chronic health conditions is a major contributor to increased health-care utilization among elderly individuals. In particular, the higher incidence of emergency conditions and more frequent atypical clinical presentations in this population lead to higher rates of emergency department visits and hospital observation compared with younger adults. These characteristics complicate the evaluation of geriatric patients in emergency settings and necessitate considering this group as a distinct patient population.[6]

The aim of this study was to evaluate the demographic characteristics, modes of presentation, reasons for admission, and clinical outcomes (referral, discharge, hospitalization, and death) of patients aged 65 years and older presenting to the Emergency Department of Mengücek Gazi Training and Research Hospital. The study sought to identify key features of emergency department utilization among geriatric patients and to contribute to geriatric patient management and health care resource planning. Ultimately, this approach aims to promote more effective emergency care delivery while reducing unnecessary crowding, costs, and workload in emergency departments.

MAIN POINTS

- Geriatric patients constitute a substantial proportion of emergency department visits, and the high rate of repeated presentations highlights the ongoing and complex healthcare needs of this population.
- Musculoskeletal disorders were the most common diagnoses in the overall geriatric population; however, with advancing age, non-specific complaints, urinary system diseases, and general condition disorders became more prominent.
- Advancing age was associated with significant increases in yellow-triage classifications and ambulance arrivals, and with a decrease in green-triage admissions, reflecting greater clinical complexity.
- Among patients aged 85 years and older, discharge rates declined markedly, while the proportions of visits resulting in hospitalization, referral, or death increased, indicating the need for heightened clinical attention in this age group.

MATERIALS AND METHODS

This study was designed as a retrospective, observational, and single-center investigation. Ethical approval for this study was obtained from the Erzincan Binali Yıldırım University Non-Interventional Clinical Research Ethics Committee (session no: 16, decision no: 2024-16/05, date: 21.11.2024 The study was conducted among patients who presented to the adult emergency department of Mengücek Gazi Training and Research Hospital between July 1, 2024, and June 30, 2025. Demographic data and clinical characteristics (triage, diagnosis, outcome) were analyzed based on patients' initial visits; however, the total number of visits and repeat visit rates were also recorded throughout the study period. During the study period, the total numbers of patients and emergency department visits were determined, and patients aged 65 years and older were selected for analysis.

Data were obtained from the hospital's electronic information management system. Demographic variables, including age and sex, were collected from patient records. Clinical variables included triage category assigned in the emergency department (green, yellow, red), mode of arrival (ambulatory or by ambulance), time of admission, and seasonal distribution of visits. Diagnoses were classified under system-based categories according to the International Classification of Diseases, 10th Revision (ICD-10). Accordingly, diagnoses were grouped into cardiovascular diseases, respiratory diseases, musculoskeletal diseases, urinary diseases, neurological/neurovascular diseases, gastrointestinal system diseases, general condition disorders, and other diseases. Consultation data included the number of consultation requests and the departments consulted. Outcome variables were categorized as discharge, referral to another center, hospitalization, and death. Patients were divided into three age groups according to the WHO classification: 65-74 years (early old age), 75-84 years (old age), and ≥ 85 years (advanced old age). Demographic characteristics, triage status, mode of arrival, outcomes, and number of repeat visits were statistically analyzed across these three age groups. Patients younger than 65 years and those with missing data were excluded from the study.

Statistical Analysis

Statistical analyses were performed using IBM SPSS Statistics for Windows version 20.0. Armonk, NY: IBM Corp.. Continuous variables were presented as mean ± standard deviation or, when appropriate, as median (minimum-maximum). Categorical variables were expressed as number (n) and percentage (%). For categorical variables, overall comparisons between age groups were performed using the chi-square test. A P value of < 0.05 was considered statistically significant.

Due to the retrospective design of the study, informed consent was not required, and all data were analyzed after anonymization.

RESULTS

Between July 1, 2024, and June 30, 2025, 183,453 patients presented to the adult emergency department of Mengücek

Gazi Training and Research Hospital, accounting for 272,103 visits. Of these visits, 18,269 (14.7%) involved patients aged 65 years or older who constituted the study cohort.

During the study period, 9.931 (54.4%) of patients aged 65 years and older presented to the emergency department only once, whereas 8.338 (45.6%) had multiple visits (range: 2-58). Among included patients, 9,960 (54.5%) were women and 8.309 (45.5%) were men. The mean age was 74.0 ± 7.2 years (range: 65-113). By age group, 10,855 patients (59.4%) were aged 65-74 years, 5,612 (30.7%) were aged 75-84 years, and 1,802 (9.9%) were aged 85 years and older. The demographic and clinical characteristics of the study population are presented in Table 1. A statistically significant difference in sex distribution was observed among age groups, with the proportion of female patients increasing with advancing age (51.7% in the 65-74 age group vs. 61.7% in the ≥ 85 age group; $P < 0.05$). Demographic and clinical characteristics, modes of presentation, triage distributions, outcomes, and diagnostic distributions by age group are summarized in Table 2.

Overall, 8.395 patients (46.0%) were triaged to the green category, 9.746 (53.3%) to the yellow category, and 128 (0.7%) to the red category. Analysis of triage categories demonstrated that the proportion of yellow-category admissions increased with age, whereas the proportion of green-category admissions decreased ($P < 0.05$). A total of 16,120 visits (88.2%) were ambulatory presentations, while 2.149 (11.8%) occurred via ambulance transport. The rate of ambulance arrival increased significantly with age (8.3% in the 65-74 age group vs. 25.1% in the ≥ 85 age group; *P < 0.05). Emergency* department visits most frequently occurred between 08:00 and 15:59 (54.8%). With respect to seasonal distribution, visits were most common during the summer months (7,312 patients, 40.0%).

When diagnoses were evaluated according to system-based categories, musculoskeletal system diseases were the most frequent diagnoses in the overall population (22.3%), followed by respiratory system diseases (17.9%) and cardiovascular system diseases (11.4%) (Table 1). The prevalence of musculoskeletal and respiratory system diseases decreased with advancing age, whereas general-condition disorders (non-specific complaints), urinary system diseases, and other diagnostic categories were more frequent in older age groups; these differences were statistically significant ($P < 0.05$).

Among the study population, 4.386 patients (24.0%) required a total of 8.590 consultation requests. Cardiology, chest diseases, internal medicine, orthopedics, and neurology were the most frequently consulted departments, listed in descending order. Overall, 16.114 patients (88.2%) were discharged from the emergency department, whereas 2.088 (11.4%) were hospitalized. As age increased, the proportion of patients discharged decreased, whereas the proportion of visits resulting in hospitalization, referral, or death increased significantly ($P < 0.05$; Table 2). The most common admission units were the coronary intensive care unit, the orthopedics unit,

Table 1. Baseline Demographic and Clinical Characteristics of the Study Population

Variable	n (%)
Sex	
Female	9.960 (54.5)
Male	8.309 (45.5)
Age (years), mean ± SD (74.0 ± 7.2)	
65-74	10.855 (59.4)
75-84	5.612 (30.7)
≥ 85	1.802 (9.9)
Mode of arrival	
Ambulatory	16.120 (88.2)
Ambulance	2.149 (11.8)
Triage category	
Green	8.395 (46.0)
Yellow	9.746 (53.3)
Red	128 (0.7)
Outcome	
Discharged	16.114 (88.2)
Hospitalized	2.088 (11.4)
Referred	34 (0.2)
Death	33 (0.2)
Time of admission	
08.00-15.59	10.021 (54.8)
16.00-23.59	6.582 (36.0)
00.00-07.59	1.666 (9.1)
Season	
Spring	3.503 (19.2)
Summer	6.276 (34.4)
Autumn	5.261 (28.8)
Winter	3.229 (17.7)
Top 5 diagnoses (grouped ICD-10)	
Musculoskeletal system diseases	4.066 (22.3)
Respiratory system diseases	3.269 (17.9)
Cardiovascular system diseases	2.085 (11.4)
General condition disorder and non-specific complaints	2.019 (11.1)
Urinary system diseases	2.073 (11.3)
Number of visits	
Single visit	9.931 (54.35)
Repeated visits (≥2)	8.338 (45.65)

Values are presented as n (%).SD, standard deviation; ICD, International Classification of Diseases.

Table 2. Demographic and Clinical Characteristics of Emergency Department Visits According to Age Groups

Variable	65-74, n (%)	75-84, n (%)	≥ 85, n (%)	*P* value
Sex				**< 0.001**
Female	5616 (51.7)	3232 (57.6)	1112 (61.7)	
Male	5239 (48.3)	2380 (42.4)	690 (38.3)	
Triage category				**< 0.001**
Green	5894 (54.3)	2150 (38.3)	351 (19.5)	
Yellow	4914 (45.3)	3412 (60.8)	1420 (78.8)	
Red	47 (0.4)	50 (0.9)	31 (1.7)	
Mode of arrival				**< 0.001**
Ambulatory	9950 (91.7)	4820 (85.9)	1350 (74.9)	
Ambulance	905 (8.3)	792 (14.1)	452 (25.1)	
Outcome				**< 0.001**
Discharged	9814 (90.4)	4854 (86.5)	1446 (80.2)	
Others (hospitalization, referral, or death)	1041 (9.6)	758 (13.5)	356 (19.8)	
Number of visits				**< 0.001**
Single	6070 (55.9)	2928 (52.2)	933 (51.8)	
Repeated (≥2)	4785 (44.1)	2684 (47.8)	869 (48.2)	
Top five diagnoses (grouped ICD-10)				**< 0.001**
Musculoskeletal system diseases	2591 (23.9)	1177 (21.0)	298 (16.5)	
Respiratory system diseases	2017 (18.6)	976 (17.4)	276 (15.3)	
Cardiovascular system diseases	1203 (11.1)	670 (11.9)	212 (11.8)	
General condition disorder and non-specific complaints	1121 (10.3)	647 (11.5)	251 (13.9)	
Urinary system diseases	1048 (9.7)	604 (10.8)	421 (23.4)	

Values are presented as n (%). Patients were categorized according to their age at the first emergency department visit. Comparisons between age groups were performed using the chi-square test. *P* value of < 0.05 was considered statistically significant.

Table 3. Distribution of Consultation and Admission Departments

Department	n (%)
Consultation departments	
Cardiology	2055 (23.9)
Chest diseases	1177 (13.7)
Internal medicine	728 (8.5)
Orthopedics	716 (8.3)
Neurology	673 (7.8)
Others	3241 (37.7)
Admission departments	
Coronary intensive care unit	286 (13.7)
Orthopedics service	284 (13.6)
Internal medicine service	209 (10.0)
Neurology service	150 (7.2)
General surgery service	145 (6.9)
Others	1014 (48.6)

Values are presented as n (%).

the internal medicine unit, the general/adult intensive care unit, and the general surgery unit. The distribution of consultation and admission departments is presented in Table 3.

DISCUSSION

In previous studies, Çığşar et al.[7] and Kekeç et al.[8] reported that geriatric patients accounted for 19.6% and 14.3% of emergency department admissions, respectively. Other studies conducted in Türkiye have reported that this proportion ranges between 9% and 23%.[3,4,9] In the present study, patients aged 65 years and older constituted 14.7% of all adult emergency department visits. This variability across studies may be attributed to differences in geographic regions and sociocultural factors. Previous reports have generally indicated a female predominance, with female proportions ranging between 51% and 59%, although some studies have reported higher proportions of male patients.[3,5,10-12] In our study, female patients accounted for 54.5% of the cohort, which is consistent with the literature. Furthermore, the proportion of female patients increased with advancing age, reaching 61.7% in the ≥ 85 age group, suggesting that women constitute a more prominent patient population among the oldest-old presenting to emergency departments.

Aydemir et al.[5] reported that the proportions of patients aged 65-74 years, 75-84 years, and ≥ 85 years presenting to the emergency department were 56.4%, 34.5%, and 9.1%, respectively. Similarly, Nur et al.[13] found that 55.1% of patients aged 65 years and older belonged to the 65-74 age group. In line with these findings, our study demonstrated that 59.4% of geriatric patients were aged 65-74 years, 30.7% were aged 75-84 years, and 9.9% were aged ≥ 85 years. These results indicate that the geriatric population presenting to emergency departments is predominantly composed of younger-old adults. The higher rates of discharge and ambulatory presentation observed among younger-old patients suggest a relatively stable clinical status, whereas increasing age appears to be associated with greater frailty and vulnerability.

In the study by Bedel and Tomruk[14], the rate of ambulance arrivals was reported as 40.6%, whereas another study reported a much lower rate of 2.5%.[5] In the present study, most emergency department visits occurred via ambulatory presentation (88.2%), while ambulance arrivals accounted for 11.8% of visits. Notably, the proportion of ambulance arrivals increased substantially with age, rising from 8.3% in the 65-74 age group to 25.1% in the ≥ 85 age group. This finding suggests that older patients, particularly those in oldest age groups, are more likely to present with severe clinical conditions that require ambulance transport. Variations in ambulance utilization across studies may be influenced by regional socioeconomic characteristics, urban infrastructure, and access to emergency medical services.

According to the findings of Aydemir et al.[5], yellow triage constituted 69.4% of emergency department visits, followed by green and red triage categories. In our study, the yellow triage category was the most common (53.3%), followed by green (46.0%) and red (0.7%). Age-stratified analysis revealed a marked increase in yellow triage assignments with advancing age, from 45.3% in the 65-74 age group to 78.8% in the ≥85 age group. Although red triage accounted for a small proportion of visits overall, its frequency increased with age, rising from 0.4% to 1.7%. These findings are consistent with previous studies and likely reflect the cumulative effects of increasing comorbidity burden, polypharmacy, and frailty associated with aging.

Öktem and Üzer[3] reported that musculoskeletal, respiratory, and circulatory system diseases were the most common reasons for emergency department admission. In another study, general condition disorders, respiratory diseases, and urinary system disorders were reported as the most frequent reasons for admission.[5] In the present study, the most common reasons for emergency department visits were musculoskeletal, respiratory, and cardiovascular system diseases. When diagnostic distributions were examined by age group, the prevalence of musculoskeletal and respiratory system diseases decreased with advancing age, whereas general condition disorders/non-specific complaints, urinary system diseases, and other diagnostic categories increased significantly in older age groups. The marked increase in urinary system diseases among patients aged ≥ 85 years may be related to age-associated declines in physiological reserve, a higher burden of comorbidities, and the predominance of atypical clinical presentations. These findings underscore the growing diagnostic complexity observed in advanced age groups.

Previous studies have reported that emergency department visits are more frequent during daytime hours (08:00-16:00).[4,9,15] Consistent with these reports, more than half of emergency department visits in our study occurred between 08:00 and 15:59, while visits during nighttime hours (00:00-07:59) were least frequent. This pattern may reflect the need for caregiver support, greater daytime activity levels, and avoidance of nighttime emergency department visits among elderly patients.

Aydemir et al.[5] reported that emergency department visits were most frequent during the winter months, although this pattern may have been influenced by the COVID-19 pandemic. In contrast, other studies have reported a higher frequency of visits during summer months.[3] In the present study, emergency department visits were most common in summer (34.4%) and least common in winter (17.7%). Seasonal variations in emergency department utilization among elderly individuals may be influenced by environmental factors (including temperature) and daily activity levels. These findings highlight the importance of incorporating seasonal and temporal patterns into emergency department staffing and resource planning.

Reported discharge, hospitalization, and mortality rates among geriatric emergency department patients vary widely in the literature, with discharge rates of 46.3%-92.4%, hospitalization rates of 3.6%-53.3%, and mortality rates of 0.3%-0.4%.[3,5,16,17] In our study, 88.2% of patients were discharged from the emergency department, 11.4% were hospitalized, and 0.2% died. When evaluated by age groups, the proportion of non-discharge outcomes (hospitalization, referral, or death) increased from 9.6% in the 65-74 age group to 19.8% in the ≥ 85 age group. These outcome distributions are consistent with previously reported ranges and emphasize the increasing need for inpatient care among older age groups.

Previous studies have reported repeat emergency department visit rates of 37%-50% within the first year.[18-21] In accordance with these findings, 45.6% of patients in our study had more than one emergency department visit within the same year. Repeat visit rates increased from 44.1% in the 65-74 age group to 48.2% in the ≥ 85 age group, suggesting that health care needs and utilization intensity increase with advancing age.

Öktem and Üzer[3] reported that 30.1% of geriatric patients required consultation, with cardiology being the most frequently consulted internal medicine specialty and orthopedics the most common surgical specialty. In our study, consultation was required in 24.0% of patients. Cardiology was the most frequently consulted department (23.9%), and orthopedics was the most frequently consulted surgical specialty (8.3%). This distribution suggests that cardiac conditions and trauma-related complaints play a substantial role in emergency department utilization among elderly patients.

In a study by Kılınç et al.[22] conducted in 2012, the most common admission departments following emergency department visits were internal medicine, chest diseases, neurology, and orthopedics. Bedel and Tomruk[14] reported that

15.8% of patients aged 65 years and older were hospitalized, with 28.7% of hospitalized patients requiring intensive care. The most common admission departments in their study were internal medicine, cardiology, chest diseases, and neurology.[14] In our study, 11.4% of patients were hospitalized, and the most common admitting unit was the coronary intensive care unit (13.7%), followed by orthopedics, internal medicine, neurology, and general surgery units. These findings indicate that hospitalizations among elderly patients are driven by traumatic injuries, cardiovascular conditions, and internal medical conditions, and that the diversity of admission diagnoses increases with advancing age, resulting in a broad spectrum of inpatient care needs.

Study Limitations

This study has several limitations. First, due to its retrospective design, the data were obtained from the hospital information management system, which may have led to missing or inaccurate information. Second, the study was conducted in a single center, which may limit the generalizability of the findings to other emergency departments. In addition, geriatric-specific triage tools, such as the Geriatric Emergency Department Triage system, were not used during triage evaluation. The absence of such geriatric-specific triage systems may have negatively affected the observed triage distribution, particularly among patients in the older age groups.

CONCLUSION

In this study, the demographic characteristics, modes of presentation, triage distributions, diagnostic profiles, clinical outcomes, repeat visit patterns, and consultation and hospitalization requirements of patients aged 65 years and older presenting to the emergency department were comprehensively evaluated. The findings indicate that the geriatric population presenting to the emergency department is predominantly composed of younger-old adults; however, with advancing age, ambulance utilization, triage priority, hospitalization rates, diagnostic diversity, and repeat-visit tendencies increase markedly.

Furthermore, the predominance of cardiopulmonary complaints and the involvement of multiple medical specialties highlight the need for a multidisciplinary approach in the emergency department management of elderly patients. Effective management of emergency department visits among geriatric patients requires developing age-specific triage strategies, strengthening multidisciplinary assessment processes, and integrating geriatric care principles into emergency department practice. Such an approach is expected to enhance patient safety and contribute to reductions in both workload and health care costs in emergency departments.

Ethics

Ethics Committee Approval: This study was approved by the Erzincan Binali Yıldırım University Non-Interventional Clinical Research Ethics Committee (session no: 16, decision no: 2024-16/05, date: 21.11.2024).

Informed Consent: Retrospective study. Permission was obtained from hospital management to collect study data from the Information Management System.

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Footnotes

Author Contributions

Concept Design – O.T., F.M.S.; Data Collection or Processing – O.T., Y.B.; Analysis or Interpretation – O.T., Y.K.; Literature Review - O.T., F.M.S., A.E.Y.; Writing, Reviewing and Editing – O.T., F.M.S., Y.B., E.Y.Ç., A.E.Y.

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