*Research Article (Araştırma Makalesi)*

# Comparison of Seasonal Changes in Patient Hospitalizations in The Emergency Department

## *Acil Servisten Yapılan Hasta Yatışlarında Mevsimsel Değişikliklerin Karşılaştırılması*

Mustafa ALPASLAN[1]

[1] Nevşehir State Hospital, Emergency Medicine Clinic, Nevşehir, Türkiye.

**Özet**

**Amaç:** Acil servisten yaz ve kış döneminde yapılan hasta yatışlarını karşılaştırmak ve ortaya çıkan sonuçlara göre acil servis işleyişi ve hastane genelinde servis ve yoğun bakım kapasitelerinin gözden geçirilmesine yönelik fikirler sunulmasıdır.

Gereç ve Yöntemler: Bu çalışma retrospektif olarak bir devlet hastanesinin erişkin acil servisinde yapıldı. Çalışma kapsamında 01.07.2023-31.07.2023 tarihleri ile 01.01.2024-31.01.2024 tarihleri arasında acil servisten hastaneye yatırılan hastalar değerlendirildi. Hastalarda yaş, cinsiyet, başvuru zamanı (tarih ve saat), yatış teşhisi, yatırıldığı klinik, servis ya da yoğun bakım yatışı ve adli vaka durumu analiz edildi.

**Bulgular:** Bu çalışmada acil servisten hastaneye yatan 978 hasta değerlendirildi. Hastaların 482'si (%49,2) kış, 496'sı (%50,8) ise yaz mevsiminde başvurmuştu. Genel olarak bakıldığında %54,2'si erkekti. Hastaların genel yaş ortalaması 61,26±21,58 oldu. En çok hasta yatışı nedenleri kış mevsiminde sırasıyla pnömoni (%24,6), akut koroner sendrom (%14,1) ve akut böbrek yetmezliği (%7,6) olurken yaz mevsiminde pnömoni (%16,3), akut koroner sendrom (%15,5) ve iskemik inme (%6,6) olmuştur. Mevsimlere göre hasta yatırılan kliniklerin dağılımına bakıldığında ise en çok yatış yapılan klinikler kış mevsiminde sırasıyla göğüs hastalıkları (%22,8), iç hastalıkları (%18) ve genel cerrahi (%14,7), yaz mevsiminde ise iç hastalıkları (%18,8), göğüs hastalıkları (%16,1) ve kardiyoloji oldu (%14,9).

**Sonuç:** Acil servisten yapılan hasta yatışlarında teşhis ve kliniksel dağılım olarak mevsimsel farklılıklar gözlenebilmektedir. Hasta yatışlarında mağduriyet yaşanmaması adına servis ve yoğun bakım kapasitelerinde mevsimsel olarak düzenlemeler yapılmalıdır.

**Anahtar Kelimeler:** Acil servis, epidemiyoloji, mevsimsel değişkenlik, hastane yatışı

**Abstract**

**Objective:** To compare summer and winter hospitalizations in the emergency department and to provide insight for reviewing the functioning of the emergency department and hospital-wide service and intensive care capacities according to the results.

**Material and Method:** This retrospective study was conducted in the adult emergency department of a state hospital. Patients hospitalized in the emergency department between 01.07.2023-31.07.2023 and 01.01.2024-31.01.2024 were evaluated. Age, gender, time of admission (date and hour), admission diagnosis, clinic of admission, service or intensive care unit admission, and forensic case status were analyzed.

**Results:** In this study, 978 patients hospitalized in the emergency department were evaluated. Of the patients, 482 (49.2%) were admitted in winter and 496 (50.8%) in summer. In general, 54.2% were male. The mean age of the patients was 61.26±21.58 years. The most common reasons for hospitalization were pneumonia (24.6%), acute coronary syndrome (14.1%) and acute renal failure (7.6%) in winter, while pneumonia (16.3%), acute coronary syndrome (15.5%), and ischemic stroke (6.6%) in summer. In terms of the distribution of the clinics in which patients were hospitalized according to the seasons, the most frequently hospitalized clinics were pulmonology (22.8%), internal medicine (18%) and general surgery (14.7%) in winter, and internal medicine (18.8%), pulmonology (16.1%) and cardiology (14.9%) in summer.

**Conclusion:** Seasonal differences in diagnosis and clinical distribution can be observed in patient hospitalizations from the emergency department. Seasonal arrangements should be made in service and intensive care capacities in order to avoid disruption in patient hospitalizations.

**Keywords:** Emergency Department, epidemiology, seasonal variation, hospitalization

**Correspondence:** Mustafa ALPASLAN, Nevşehir Devlet Hastanesi, Acil Tıp Kliniği, Nevşehir, Türkiye

**Phone:** +90 507 148 38 94 **e-mail:** mustafalpaslan@gmail.com

**ORCID No:** 0000-0003-3170-0125

**Submission date:** 14.08.2024

**Acceptance date:** 03.03.2025

**DOI:** 10.17517/ksutfd.1533165

## INTRODUCTION

Emergency departments are units where all patient groups are evaluated extensively and medical care and treatment services are provided. Emergency departments offer the diagnosis and treatment of acute and chronic diseases, as well as the opportunity to perform emergency surgical intervention and hospitalization and treatment of patients when necessary by organizing with other clinics (1,2). Today, people prefer to apply to the emergency department for all kinds of urgent and non-urgent health complaints. The unnecessary increase in these admissions has become an important problem related to public health and the healthcare system (1). The most important role of emergency departments is to prevent the increase in morbidity and mortality that may occur if patients are not treated urgently. However, these units also serve a significant proportion of non-urgent cases. One of the most important problems hindering the workflow in emergency departments is that patients whose diagnosis and emergency treatment process have been completed and who will be hospitalized are waiting in the emergency department. The reason for this situation is usually the lack of physicians in the relevant branch and hospital bed occupancy. Analyzing the use of emergency services by patients and the problems that occur on a national scale will be effective in solving this important health problem (2).

Patient presentations and complaints in the emergency department may vary according to the seasons. Indeed, in some studies, it was reported that the rate of admission due to trauma was higher in summer months (3-5). In a study examining the distribution of patients' presentations to the emergency department according to seasons, it was observed that presentations due to acute exacerbation of chronic obstructive pulmonary disease increased, especially in winter months (5). A good analysis of the patients admitted to emergency departments periodically and their characteristics is also necessary for planning the working patterns of physicians and other healthcare personnel to be employed in emergency departments and throughout the hospital. With proper planning, both the management of patients can be faster and more successful, and the waiting time in the emergency department can be reduced (6).

In this study, it was aimed to compare patient hospitalizations in the emergency department in the summer and winter periods and, according to the results, to review the functioning of the emergency department and hospital-wide ward and intensive care unit capacities and to give an opinion about the distribution of the number of personnel employed.

## MATERIALS AND METHODS

### Data Collection and Analysis

This retrospective study was conducted in the adult emergency department of a state hospital providing secondary health care services. Patients hospitalized in the emergency department between 01.07.2023-31.07.2023 and 01.01.2024-31.01.2024 were evaluated. The date ranges determined in the study were selected according to them on this with the highest number of patient admissions and hospitalizations in recent history. All age groups were included in the study, and internal (non-trauma) patients admitted to obstetrics and gynecology and pediatric emergency departments were excluded. Data on the number of patients included in the study and the exclusion criteria are given in **Figure 1**. Age, gender, time of admission (date and

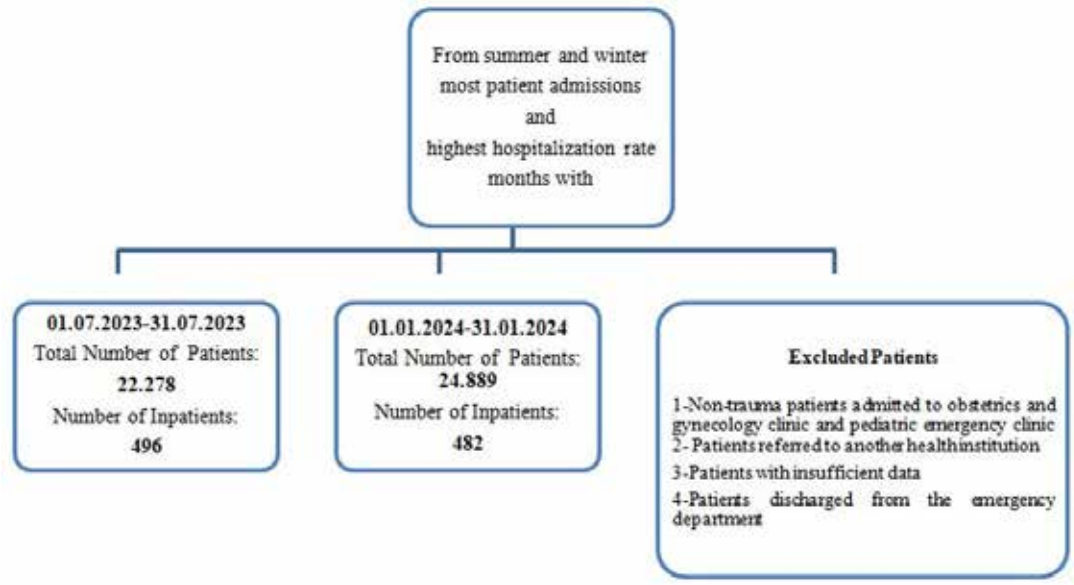


**Figure 1.** Number of patients included in the study and exclusion criteria

time), admission diagnosis, hospitalization clinic, service or intensive care unit stay, and forensic case status were analyzed. Comparative analyses were performed with the data obtained.

Data were collected in the hospital electronic health record (SISOFT data management system). Patients with insufficient data and patients who were referred to another health center were not included in the study.

### Statistical Analysis

Statistical Packagefor Social Science sfor Windows 21.0 (SPSS 21.0) program was used to analyze th edata. Descriptive statistics (frequency, percentage distribution) and 'Chi-square test' for the comparison of categorical variables between two groups and 'Student T test' for the comparison of independent groups were used for statistical analysis. The results are presented as mean ± SD or frequency (percentage) and $p < 0.05$ is statistically significant at 95 percent confidence interval. Chi-square analyses were performed by considering the frequency of the expected value in tables with n*n (2*2) matrices. In tables with n*p (2*3) matrices, the p value was given by considering the percentage value of the probability of the expected value being less than 5.

### Ethics Committee Approval

Before the study, the approval of Nevşehir Hacı Bektaş University Non-Interventional Clinical Research Ethics Committee, numbered 2024/03 and dated 21/03/2024, was obtained. The Helsinki Declaration principles were followed.

## RESULTS

In the center where the study was conducted, the number of patients admitted to the emergency department in July 2023 was 22,278, and the hospitalization rate was 2.2% (n=496). On the other hand, the number of patients admitted to the emergency department in January 2024 was 24,889 and the hospitalization rate was 1.9% (n=482).

In this study, 978 patients hospitalized from the emergency department were evaluated. Of the patients, 482 (49.2%) were admitted in winter and 496 (50.8%) in summer. Over all, 54.2% were male. Among the patients hospitalized in the summer and winter seasons, the male sex was more common and there was no significant seasonal difference between the genders (p=0.117) **(Table 1)**. The over all meanage of the patients was 61.26±21.58 years. When we look at the distribution of patient hospitalizations according to age ranges, the highest number of hospitalizations was in the 61-80 age range (41.5%). Graphical distribution of patients according to season and age distribution is given in **Figure 2**. In general, there was a significant seasonal difference between the menage of inpatients (p=0.043) **(Table 1)**. When the time of presentation of the patients to the emergency department was analyzed, it was observed that the most frequent presentation was between 08.00-15.59 hours regardless of seasonal differences **(Table 1)**. The majority of the patients were admitted in the service without seasonal difference (p=0.053) **(Table 1)**. There was a significant difference

**Table 1. Demographic characteristics of patients, time of admission, service and intensive care hospitalization and forensic case rates**

| Data<br>Gender | General Distribution<br>Number of Patients (n) / Ratio (%) | Winter Season<br>Number of Patients (n) / Ratio (%) | Summer Season<br>Number of Patients (n) / Ratio (%) | p value |
|---|---|---|---|---|
| Male | 530 (54.2) | 249 (51.7) | 281 (56.7) | p=0.117* |
| Female | 448 (45.8) | 233 (48.3) | 215 (43.3) | |
| **Age (average)** | 61.26±21.58 | 62.68±20.96 | 59.88±22.10 | p=0.043** |
| **Application Time** | | | | |
| 08.00-15.59 | 486(49.7) | 240 (49.8) | 246 (49.6) | p=0.915* |
| 16.00-23.59 | 366 (37.4) | 178 (36.9) | 188 (37.9) | |
| 24.00-07.59 | 126 (12.9) | 64 (13.3) | 62 (12.5) | |
| **Hospitalization** | | | | |
| Service | 795 (81.3) | 380 (78.8) | 415 (83.7) | p=0.053* |
| Intenive Care Unit | 183 (18.7) | 102 (21.2) | 81 (16.3) | |
| **Forensic Case** | 71 (7.3) | 28 (5.8) | 43 (8.7) | p=0.085* |
| **Total** | **978 (100)** | **482 (100)** | **496 (100)** | |

*'Chi-square test' was used to compare categorical variables between two groups.**'Student T test' was used to evaluate the data between two independent groups.

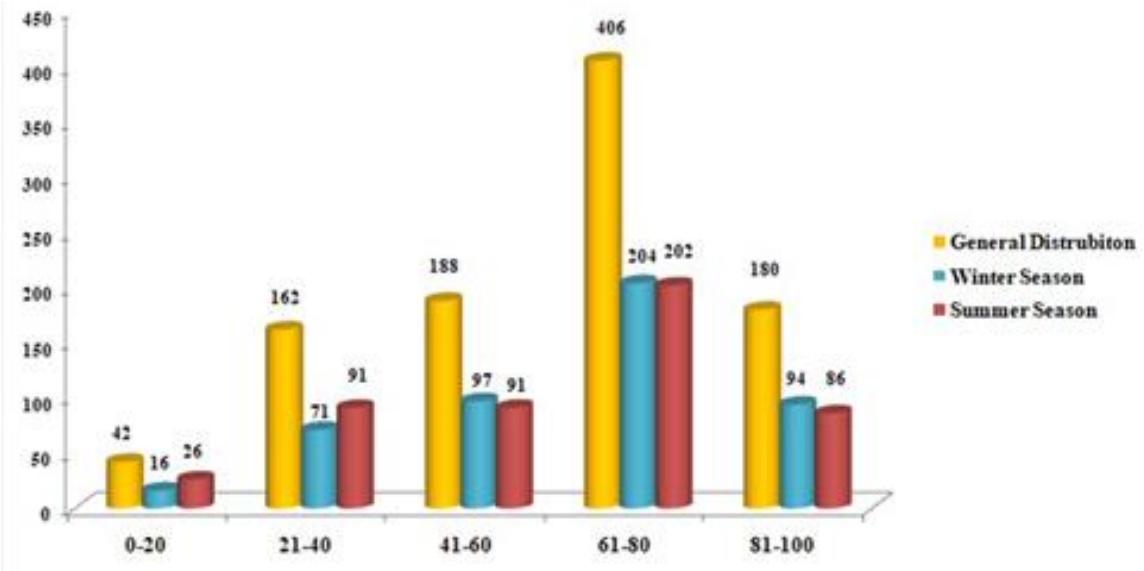


**Figure 2.** Seasonal distribution of the number of patients by age groups

in the hospitalization of patients according to age ranges ($p<0.05$). The age group with the highest number of service (39.6%) and intensive care unit (49.7%) hospitalizations was the 81-100 age group. On the other hand, the age group with the lowest number of service (0%) and intensive care unit (0.5%) hospitalizations was the 0-20 age group. The rate of forensic cases was higher in summer (8.7%). There was no significant difference between the rate of forensic cases in summer ($p=0.085$) **(Table 1)**. In the comparison of forensic cases by gender, although the rate of forensic cases was higher in males (7.9%), there was no significant difference between both genders in terms of forensic cases ($p=0.383$). Therewas a significant difference in forensic case rates according to age ranges ($p<0.05$). Accordingly, the highest rate of forensic cases was 42.9% in the 0-20 age range. When the application hours of forensic cases were analyzed, it was observed that the most common time of application was between 08.00-15.59 hours with a rate of 42.2%.

The most common reasons for hospitalization were pneumonia (24.6%), acute coronary syndrome (14.1%) and acute renal failure (7.6%) in the winter season and pneumonia (16.3%), acute coronary syndrome (15.5%) and ischemic stroke (6.6%) in the summer season **(Table 2)**. When the distribution of the clinics in which patients were hospitalized according to the seasons was analyzed, the most common clinics were pulmonology (22.8%), internal medicine (18%) and general surgery (14.7%) in winter, and internal medicine (18.8%), pulmonology (16.1%) and cardiology (14.9%) in summer **(Table 3)**. There was a significant difference in the distribution of diagnoses in patients according to age ranges ($p<0.05$) **(Table 4)**. There was no significant difference between age and diagnosis when analyzed seasonally ($p=0.057$).

## DISCUSSION

Emergency departments in hospitals are the units to which the community makes the highest number of applications, but they are also areas where patient admission is mandatory and management is very difficult. In these areas where patients are examined as outpatients or hospitalized in other clinics, the number of applications and workload have been increasing recently. The reason for this is reported to be due to population increase, inadequacy of health services provided in primary health care centers, external migration and an increase in inappropriate non-emergency patient applications to the emergency department (7-9). In this study, it was to obtain data that would contribute to emergency department work plans by analyzing the seasonal distribution and demographic characteristics of patients hospitalized in the emergency department.

In the center where the study was conducted, the number of patients admitted to the emergency department in July 2023 was 22,278 and the hospitalization rate was 2.2% (n=496). On the other hand, the number of patients admitted to the emergency department in January 2024 was 24,889 and the hospitalization rate was 1.9% (n=482). Looking at the rates of hospitalization from the emergency department in similar studies in the literature, it is seen that 3.57% (10) in the Cevik et al. study, 5.4% (11) in the Sonmez et al. study, 12.5% (12) in the Kılıcaslan et al. study, and 8.1% (13) in a study by Yuksel. When the hospitalization rates in the studies are examined, it is seen that the hospitalization

**Table 2. DxSeasonal distribution of the number of patients hospitalized from the emergency department according to diagnoses**

| Diagnosis | Winter Season | Summer Season | Total |
|---|---|---|---|
| | Number of Patients (n) | Number of Patients (n) | Number of Patients (n) |
| Pneumonia | 119 | 81 | 200 |
| Acute coronary syndrome | 68 | 77 | 145 |
| Acute renal failure | 37 | 32 | 69 |
| Ischemıc stroke | 29 | 33 | 62 |
| Lower extremity fracture | 25 | 32 | 57 |
| Acute appendicitis | 33 | 20 | 53 |
| Urinary tract infection | 13 | 18 | 31 |
| Ileus | 17 | 14 | 31 |
| Intracranial hemorrhage | 13 | 16 | 29 |
| Acute pancreatitis | 14 | 11 | 25 |
| Malignancy | 11 | 12 | 23 |
| Acute cholecystitis | 9 | 12 | 21 |
| Gastroenteritis | 3 | 17 | 20 |
| Gastrointestinal hemorrhage | 5 | 14 | 19 |
| Upper extremity fracture | 7 | 11 | 18 |
| Gonarthrosis | 5 | 11 | 16 |
| Urological emergencies* | 6 | 7 | 13 |
| Hemothorax / Pneumothorax | 3 | 9 | 12 |
| Vertebral fracture | 5 | 6 | 11 |
| Suicide attempt | 6 | 5 | 11 |
| Complication of cirrhosis | 7 | 4 | 11 |
| Diabetic ketoacidosis | 6 | 4 | 10 |
| Soft tissue infection | 3 | 7 | 10 |
| Rib fracture | 2 | 6 | 8 |
| Head bone fracture | 3 | 4 | 7 |
| Electrolyte disturbance | 4 | 3 | 7 |
| Peripheral arterial embolism | 5 | 2 | 7 |
| Intra-abdominal organ injury | 3 | 3 | 6 |
| Eye emergencies** | 1 | 5 | 6 |
| Gynecological emergencies*** | 5 | 0 | 5 |
| Inguinal hernia | 1 | 4 | 5 |
| Acute diverticulitis | 2 | 3 | 5 |
| Hematologic emergencies**** | 1 | 4 | 5 |
| Epilepsy | 2 | 2 | 4 |
| Connective tissue injury | 1 | 3 | 4 |
| Pulmonary embolism | 3 | 0 | 3 |
| Central venous catheter insertion | 3 | 0 | 3 |
| Foreign body in the larynx | 0 | 1 | 1 |
| **Total** | **482** | **496** | **978** |

*__Urologicalemergencies:__ Urolithiasis, massive hematuria, glob vesicale, **__Eye emergencies__: Corneal injury, eye perforation, ***__Gynecologic emergencies:__ Ovarian torsion, trauma in pregnancy and threatened miscarriage, ****__Hematologic emergencies:__ Deep anemia, neutropenic fever

**Table 3. Distribution of the number of patients hospitalized from the emergency department according to clinics**

| Clinic | Winter Season Number of Patients (n) | Summer Season Number of Patients (n) | Total Number of Patients (n) |
|---|---|---|---|
| Pulmonary Diseases | 110 | 80 | 190 |
| Internal Medicine | 87 | 93 | 180 |
| Cardiology | 67 | 74 | 141 |
| General Surgery | 71 | 59 | 130 |
| Orthopedics | 40 | 60 | 100 |
| Neurology | 33 | 38 | 71 |
| Infectious Diseases | 24 | 27 | 51 |
| Brain and Nerve Surgery | 19 | 23 | 42 |
| Thoracic Surgery | 5 | 16 | 21 |
| Urology | 8 | 10 | 18 |
| Cardiovascular Surgery | 8 | 2 | 10 |
| Anesthesiology and Reanimation | 3 | 5 | 8 |
| Eye Diseases | 1 | 5 | 6 |
| Gynecology and Obstetrics | 5 | 1 | 6 |
| Psychiatry | 0 | 2 | 2 |
| Pediatric Surgery | 1 | 0 | 1 |
| Ear Nose Throat | 0 | 1 | 1 |
| **Total** | **482** | **496** | **100** |

rates are lower in state hospitals that provide health services as the second level of care, as in this study, and inappropriate patient admission in terms of emergency service is higher. Hospitalization rates may vary according to the health care centers and service levels of the institutions in the health care system where the studies were conducted. Kose et al. reported a hospitalization rate of 1.4% in a study conducted in a state hospital (14), while Aydın et al. reported a hospitalization rate of 12.2% in a study conducted in a university hospital (15).

In the study by Atherton et al., the rate of admission to the emergency department due to trauma increases in the summer months (3). Bhattacharya et al. reported that trauma cases were more common in the summer months compared to other months, even in poor weather conditions (4). In Türkiye, Emet et al. found that trauma cases were more common in patients admitted to the emergency department in the summer months (16). In a study conducted by Cevik et al. to analyze the diagnosis codes of patients admitted to the emergency department, it was reported that there were more admissions due to urinary system disorders, respiratory diseases, skin and skin diseases, trauma, gastroenteritis, abdominal pain and psychiatric diseases in the summer months, while ear, nose, throat and eye diseases were more common in the winter months (10). In some studies, it was reported that the highest number of patient admissions occurred in winter months (5,6,13). In a study conducted by Yuksel, the most common reasons for admission were acute upper respiratory tract infection in winter and abdominal pain and gastroenteritis in summer (13). In his specialty thesis study, Tascı examined the relationship between meteorological factors and the incidence of pneumonia and stated that the frequency of admission to the emergency department due to pneumonia increased in periods when the air temperature was low and high (17). In the same study, it was observed that the rate of pneumonia increased significantly on days with increased humidity (17). In some studies, it was reported that the frequency of pneumococcal infection and the rate of hospitalized patients increased in winter months (18,19). When the data obtained in this study were evaluated, it was observed that the most common reason for hospitalization was pneumonia in summer and winter. Cases of urinary tract infection, gastroenteritis, and injuries secondary to trauma were more common in summer compared to winter. The higher incidence of trauma cases in the summer months was similar to the literature.

**Table 4. Distribution of the number of patients hospitalized from the emergency department according to diagnosis and age ranges**

| Diagnosis | Age Range / Number of Patients (n) | | | | | Total Number of Patients (n) |
|---|---|---|---|---|---|---|
| | 0-20 | 21-40 | 41-60 | 61-80 | 81-100 | |
| Pneumonia | 0 | 10 | 22 | 113 | 55 | 200 |
| Acute coronary syndrome | 1 | 6 | 40 | 75 | 23 | 145 |
| Acute renal failure | 0 | 1 | 14 | 29 | 25 | 69 |
| Ischemıc stroke | 0 | 0 | 5 | 37 | 20 | 62 |
| Lower extremity fracture | 7 | 11 | 9 | 20 | 10 | 57 |
| Acute appendicitis | 3 | 36 | 11 | 3 | 0 | 53 |
| Urinary tract infection | 2 | 1 | 5 | 15 | 8 | 31 |
| Ileus | 0 | 2 | 11 | 13 | 5 | 31 |
| Intracranial hemorrhage | 5 | 11 | 3 | 6 | 4 | 29 |
| Acute pancreatitis | 0 | 0 | 12 | 13 | 0 | 25 |
| Malignancy | 0 | 4 | 6 | 13 | 0 | 23 |
| Acute cholecystitis | 0 | 4 | 5 | 7 | 5 | 21 |
| Gastroenteritis | 2 | 3 | 5 | 7 | 3 | 20 |
| Gastrointestinal hemorrhage | 0 | 5 | 4 | 2 | 8 | 19 |
| Upper extremity fracture | 2 | 13 | 1 | 2 | 0 | 18 |
| Gonarthrosis | 0 | 2 | 3 | 9 | 2 | 16 |
| Urological emergencies* | 0 | 2 | 4 | 3 | 4 | 13 |
| Hemothorax / Pneumothorax | 4 | 4 | 0 | 4 | 0 | 12 |
| Vertebral fracture | 0 | 4 | 4 | 2 | 1 | 11 |
| Suicide attempt | 1 | 10 | 0 | 0 | 0 | 11 |
| Complication of cirrhosis | 0 | 1 | 4 | 6 | 0 | 11 |
| Diabetic ketoacidosis | 0 | 3 | 4 | 3 | 0 | 10 |
| Soft tissue infection | 0 | 2 | 5 | 1 | 2 | 10 |
| Rib fracture | 1 | 5 | 2 | 0 | 0 | 8 |
| Head bone fracture | 5 | 2 | 0 | 0 | 0 | 7 |
| Electrolyte disturbance | 0 | 0 | 1 | 6 | 0 | 7 |
| Peripheral arterial embolism | 0 | 1 | 0 | 2 | 4 | 7 |
| Intra-abdominal organ injury | 4 | 2 | 0 | 0 | 0 | 6 |
| Eye emergencies** | 1 | 2 | 2 | 1 | 0 | 6 |
| Gynecological emergencies*** | 1 | 4 | 0 | 0 | 0 | 5 |
| Inguinal hernia | 0 | 4 | 0 | 1 | 0 | 5 |
| Acute diverticulitis | 2 | 0 | 3 | 0 | 0 | 5 |
| Hematologic emergencies**** | 1 | 1 | 0 | 2 | 1 | 5 |
| Epilepsy | 0 | 3 | 0 | 1 | 0 | 4 |
| Connective tissue injury | 0 | 1 | 0 | 3 | 0 | 4 |
| Pulmonary embolism | 0 | 0 | 1 | 2 | 0 | 3 |
| Central venous catheter insertion | 0 | 1 | 0 | 2 | 0 | 3 |
| Foreign body in the larynx | 0 | 0 | 0 | 1 | 0 | 1 |
| **Total** | **42** | **162** | **188** | **406** | **180** | **978** |

*__Urological emergencies:__ Urolithiasis, massive hematuria, glob vesicale, **__Eye emergencies__: Corneal injury, eye perforation, ***__Gynecologic emergencies:__ Ovarian torsion, trauma in pregnancy and threatened miscarriage, ****__Hematologic emergencies:__ Deep anemia, neutropenic fever

In this study, it was observed that there was no seasonal difference in terms of gender among hospitalized patients (p=0.117). In a similar study, it was reported that there was no seasonal difference between the rates of emergency department visits according to patient gender (13). In this study, the most common reason for hospitalization was pneumonia, and the rate of male patients was 55.5%. In a similar study, 53.2% of the patients hospitalized due to pneumonia in the emergency department were male (17).

In one study, the mean age of patients hospitalized from the emergency department was 51.77±24.32 years for females and 49.79±24.76 years for males (20). In this study, the mean age may have been higher because patients admitted from the pediatric emergency department were not included in the study. In this study, the most common reason for hospitalization was pneumonia. The mean age of patients hospitalized with pneumonia was 71.9 years in this study, while in a similar study, the mean age of patients hospitalized for pneumonia in the emergency department was 71.5 years (21). Tascı reported that the mean age of patients hospitalized due to pneumonia in the emergency department was 77.7 years (17).

The highest number of admissions to emergency departments is usually during daytime hours. Kılıcaslan et al. reported that the highest number of patient admissions to the emergency department was between 08.00-15.59 hours (42.9%) (12), and Tanrıkulu et al. reported that the highest number of admissions was between 08.00-17.00 hours (46.1%) (20). Emet et al. analyzed the admission hours in two stages as 08.00-17.00 and 17.00-08.00 in their study and reported that most admissions were between 17.00-08.00 with a rate of 54% (16).

In one study, cardiology, general surgery, and orthopedics were the clinics where most patients were hospitalized from the emergency department, respectively (20). In the same study, the most common diagnoses of hospitalization were cardiovascular diseases, hospitalizations due to trauma and hospitalizations due to diagnoses related to the gastrointestinal system (20). Unlike this study, it can be said that different results emerged because patient diagnoses were categorized differently. In the study of Tanrıkulu et al., it was observed that the number of patient hospitalizations was higher in the summer season compared to the winter season and unlike this study, the number of patients hospitalized in the intensive care unit was higher in the summer season (20). It is predicted that forensic case rates increase in emergency departments in the summer months. In the study by Levent et al. on seasonal retrospective examination of forensic cases admitted to the emergency department within a year, it was observed that the highest number of forensic case admissions occurred in the summer months (22). In studies conducted in the literature on the subject, the rate of patients admitted to the emergency department as forensic cases in summer months and daytime hours is higher compared to other periods (22-25). In this study, similar to the literature, the rate of forensic cases in inpatients was higher in the summer season and between 08.00-15.59 hours.

It has been observed that prolonged stay of patients requiring hospitalization in the emergency department increases the intensity of the emergency department (26). Considering that patient circulation in emergency departments is extremely high, such problems should be solved as soon as possible. In addition, it is seen that there is an increase in emergency department admissions every day. It is obvious that larger emergency department areas and more personnel will be needed to provide faster and higher-quality patient care and treatment in emergency departments. It is recommended that patients should be educated and directed to primary health care institutions in order to reduce the intensity of emergency departments (27).

Conclusion, in this study, it is seen that there are differences, especially in the diagnoses of hospitalized patients according to the seasons. Due to the high number of trauma cases, especially in summer months, measures should be taken in the emergency department for this situation. The number of personnel working in the trauma unit should be increased, and annual leaves should be planned accordingly. In addition, hospital administrations should pay attention to ensure that the number of physicians working in surgical branches is sufficient and that their leave status is adjusted accordingly. Particular attention should be paid to ensure that more experienced physicians and allied health personnel who are specialists in the surgical field work in the trauma department of the emergency department. On the other hand, it is observed that pneumonia cases increase in winter months. Seasonal arrangements should be made accordingly in the services and intensive care units throughout the hospital. The number of personnel working in the chest diseases clinic should be increased, especially in winter months. Necessary measures should be taken to prevent contagion and care should be taken to increase the number of isolated rooms. Necessary measures should be taken to reduce the workload of the personnel working in these units and to prevent them from facing infectious diseases.

## Limitations of the Study

Since the emergency departments of the gynecology and obstetrics clinic and the pediatrics clinic provide

separate services, patients admitted to these two clinics were not included in the study, and only patients evaluated in the general adult emergency department due to trauma were analyzed.

**Ethics:** Before the study, the approval of Nevşehir Hacı Bektaş University Non-Interventional Clinical Research Ethics Committee, numbered 2024/03 and dated 21/03/2024, was obtained. The Helsinki Declaration principles were followed.

**Conflict of Interest:** The author declares no conflict of interest.

**Declaration of Financial Support:** The author declares no financial support.

**Ethical Statement:** The author declares that he/she complies with research and publication ethics.

**Author contribution:** Concept, writing, hypothesis, editing, data collection: M.A..

## REFERENCES


1. Burt CW, McCaig LF. Trends in Hospital Emergency Department Utilization: United States, 1992-99. Vital Health Stat 13. 2001;150:1-34.
2. McCaig LF, Burt CW. National Hospital Ambulatory Medical Care Survey: 2002 Emergency Department Summary. Adv Data 2004;18:1-34.
3. Atherton WG, Harper WM, Abrams KR. A Year's Trauma Admissions and the Effect of the Weather. Int. J. Care Injured 2005; 36: 40-6.
4. Bhattacharyya T, Millham FH. Relationship Between Weather and Seasonal Factors and Trauma Admission Volume at a Level I Trauma Center. J Trauma. 2001;51:118-22.
5. Satar S, Sebe A, Avcı A, Karakus A, Icme F. Elderly Patient and Emergency Service. Journal of Cukurova University Faculty of Medicine 2004;29:43-50.
6. Batal H, Tench J, McMillan S, Adams J, Mehler PS. Predicting Patient Visits to an Urgent Care Clinic Using Calendar Variables. Acad Emerg Med. 2001; 8: 48-53.
7. Afilalo J, Marinovich A, Afilalo M, Colacone A, Leger R, Unger B, et al. Nonurgent Emergency Department Patient Characteristics and Barriers to Primary Care. AcadEmergMed. 2004;11(12):1302-10.
8. Bezzina AJ, Smith PB, Cromwell D, Eagar K: Primary Care Patients in the Emergency Department: Who Are They? A Review of the Definition of the 'Primary Care Patient' in the Emergency Department. Emerg Med Australas 2005;17(5-6):472-9.
9. Oktay C, Cete Y, Eray O, Pekdemir M, Gunerli A. Appropriateness of Emergency Department Visits in a Turkish University Hospital. Croat Med J 2003;44(5):585-91.
10. Cevik C, Tekir O. Diagnosis Codes, Triage and Sociodemographic Evaluation of Emergency Department Admissions. Balıkesir Journal of Health Sciences 2014;(2):102-7.
11. Sonmez CI, Baser DA, Uludag G, Kara H, Peker A, Taskaya K et al. Reasons and Related Factors of Adult Patients Applying to the Emergency Department of Duzce University Family Medicine Outpatient Clinic. Konuralp Medical Journal. 2019;11(2):195-201.
12. Kılıcaslan I, Bozan H, Oktay C, Goksu E. Demographic Characteristics of Patients Admitted to the Emergency Department in Turkey. Turkish Journal of Emergency Medicine 2005;5(1):5-131.
13. Yuksel A. Evaluation of the Patient Profile Admitted to the Adult Emergency Department in terms of Triage With Diagnosis Codes. Anatolian J Emerg Med. 2020;3(2):37-41.
14. Kose A, Kose B, Oncu MR, Tugrul F. Profile of Patients Presenting to a State Hospital Emergency Department and Appropriateness of Admission. Gaziantep Medical Journal 2011; 17(2):57-62.
15. Aydın T, Akkose S, Koksal O, Ozdemir F, Kulac S, Bulut M. Evaluation of the Characteristics of Patients Applying to the Emergency Department of Uludag University Faculty of Medicine Hospital and Emergency Department Studies. Academic Journal of Emergency Medicine. 2010;163-8.
16. Emet M, Uzkeser M, Eroglu M, Aslan S, Cakır Z. The Relationship of Patients Referred to the Emergency Department of a State Hospital in a Year with Time. The Euroasian Journal of Medicine. 2007;39:119-123.
17. Tascı SS. Meteorological Parameters in Relation to Pneumonia, Medical Specialization Thesis, Baskent University Faculty of Medicine, Department of Emergency Medicine, Ankara, 2017.
18. Jain S, Williams DJ, Arnold SR, Ampofo K, Bramley AM, Reed C, et al. Community-Acquired Pneumonia Requiring Hospitalization Among US Children. N Engl J Med. 2015; 372(9):835-45.
19. PY IT, Madoff LC, O'Connell M, Pelton SI. Seasonal Variation in Penicillin Susceptibility and Invasive Pneumococcal Disease. Pediatr Infect Dis J. 2015;34(4):456-7.
20. Tanrıkulu CS, Tanrıkul Y, Karaman S. Review of the Patients Hospitalized from the Emergency Service and Applying to the Emergency Service: A Cross-Sectional Analysis of a Training Hospital. J Clin Anal Med 2014;5(2):128-32.
21. Altunok I, Eroglu SE, Ozen C, Yıldız MN. Investigation of the Relationship Between Neutrophil Lymphocyte Ratios and Emergency Department Outcomes of Patients Diagnosed with Pneumonia and Lower Respiratory Tract Infection in the Emergency Department. Anatolian J Emerg Med. 2019;2(3):8-12.
22. Levent S, Pamukcu G, Kavaklı HS, Kurtoglu Celik G, Coskun S. Seasonal Retrospective Examination of Forensic Cases Referred to the Emergency Department within a Year. Journal of Forensic Medicine. 2015;29(1):1-5.
23. Demircan A, Keles A, Gurbuz N, Bıldık F, Aygencel GF, Dogan NO, et al. Forensic Emergency Medicine: Six-Year Experience of 13823 Cases in a University Emergency Department. Turk Med Sci 2008;8(6):567-75.
24. Turkcuer I, Gozlukaya A, Serinken M, Ozen M, Aydın B. Admission Times of Forensic Cases to the Emergency Department. Academic Journal of Emergency Medicine 2010;9(2): 89-92.
25. Cakır Z, Aslan S, Bilir O,Kandis H, Uzkeser M, Ocak T, et al. Retrospective Analysis of Forensic Trauma Cases Referred to the Emergency Department. Academic Journal of Emergency Medicine. 2006;4(6):32-7.
26. Lambe S, Washington DL, Fink A, Laouri M, Liu H, Scura-Fosse J, et al. Waiting Times in California's Emergency Departments. Ann Emerg Med. 2003;41(1):35-44.
27. Cımrın AH, Karcıoglu O, Atilla R. Emergency Department and Academic Emergency Medicine. Dokuz Eylul University Department of Emergency Medicine, Izmir, 2002:138-139.