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Interhospital Referrals from the Emergency Department of a District State Hospital in the Balıkesir Region, Türkiye: A Retrospective Analysis of Reasons, Timing, and Outcomes

Veysi ERYIGIT [1]

[1] *Department of Emergency, Balikesir State Hospital, Balikesir/Türkiye*

Abstract

Aim: Emergency departments play a central role in emergency referral systems by coordinating interhospital patient transfers for acute medical conditions. This study aimed to retrospectively evaluate the reasons, timing, and clinical outcomes of interhospital referrals from the emergency department of a district state hospital.

Methods: This retrospective observational study included adult patients (≥18 years) referred from the ED to other hospitals between January 1, 2025, and July 1, 2025. Demographic characteristics, diagnostic groups, referral reasons, receiving specialties, timing of referral, and clinical outcomes at the receiving hospitals were analyzed. Temporal factors (month, day of the week, and time interval) were also examined in relation to referral outcomes.

Results: During the study period, 29,156 patients presented to the ED, of whom 502 (1.72%) were referred to other hospitals. After excluding pediatric cases, 478 adult patients were included in the analysis. Referrals occurred most frequently in June (19.2%), on Tuesdays (15.9%), and during the 16:00–23:59 time interval (45.4%). The most common referral destinations were cardiology (27.8%), neurology (16.3%), and pulmonology (14.4%). Overall, 349 referred patients (73.0%) were hospitalized at the receiving institutions. No statistically significant associations were observed between referral outcomes and temporal variables ($p > 0.05$).

Conclusions: Interhospital referrals from the emergency department of a district state hospital constituted a small proportion of total ED admissions but resulted in a high rate of hospitalization. Referrals were predominantly related to cardiopulmonary and neurological emergencies and were mainly directed to medical specialties. The absence of significant temporal effects suggests that referral decisions were primarily driven by clinical necessity rather than time-related factors.

Keywords: Emergency department referrals, interhospital patient transfer, emergency referral system, district state hospital, Türkiye, hospitalization outcomes, retrospective study

Correspondence: Dr. Veysi ERYIGIT, Department of Emergency, Balikesir State Hospital, Balikesir/Türkiye
E-mail: veryigit35@gmail.com **ORCID-ID:** 0000-0002-1593-6333
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Introduction

Emergency departments (EDs) are critical units within healthcare systems, providing uninterrupted 24-hour medical care for patients presenting with acute and potentially life-threatening conditions [1]. According to the American College of Emergency Physicians (ACEP), EDs are designed to evaluate patients with unexpected illness or injury, ensure rapid assessment and stabilization, initiate treatment, and arrange transfer to higher-level centers when advanced care is required [2]. Interhospital referrals from EDs constitute a key component of emergency care delivery, particularly in district state hospitals within the Turkish healthcare system.

Following the initial assessment in the ED, it is essential that patients receive definitive care at the presenting facility whenever adequate specialist availability, medical equipment, diagnostic capacity, and inpatient resources are present. Referral to another healthcare institution should only be considered after the patient has been stabilized and when the required diagnostic or therapeutic interventions cannot be safely provided at the initial facility [3]. Inappropriate or avoidable transfers may increase both clinical risk and healthcare system burden.

Interhospital patient transfer is a complex process requiring effective coordination and communication among the referring ED, emergency command systems, and the receiving hospital. Despite careful planning, patient transfers may be associated with increased morbidity and mortality, particularly in emergency settings [4]. Therefore, minimizing unnecessary referrals and optimizing transfer decisions are essential for improving patient safety and healthcare efficiency.

District state hospitals, particularly those operating Level I EDs, often face limitations related to specialist availability, advanced diagnostic tools, and intensive care capacity. As a result, referrals to higher-level centers are frequently required. However, data regarding the reasons, timing, and outcomes of interhospital referrals from EDs in Türkiye remain limited [5]. Understanding referral patterns is crucial for identifying system-level deficiencies, improving resource allocation, and supporting evidence-based referral policies.

The present study retrospectively evaluates the demographic characteristics, referral reasons, timing, and clinical outcomes of adult patients referred from the ED of a district state hospital to other healthcare institutions. By analyzing both temporal factors and post-referral outcomes, this study aims to contribute to the limited national literature and provide data that may support more efficient and safer referral practices in emergency care settings.

Methods

Study Design and Setting

This retrospective, observational study was conducted in the ED of a district state hospital operating as a Level I emergency service. The study aimed to evaluate the demographic characteristics, referral reasons, timing patterns, and clinical outcomes of adult patients referred from the ED to other healthcare institutions.

Ethical Approval

Ethical approval for the study was obtained from the Balıkesir Atatürk City Hospital Scientific Research Ethics Committee (Decision No: 2025/09/111). Due to the retrospective nature of the study, informed consent was waived.

Study Population

During the six-month study period, from January 1, 2025, to July 1, 2025, a total of 502 patients were referred from the ED to other hospitals. Patients younger than 18 years of age (n = 24) were excluded. Consequently, the final study population consisted of 478 adult patients aged 18 years and older whose medical records were complete and accessible.

Data Collection

Data were extracted retrospectively from the hospital information management system. The following variables were recorded:

Demographic characteristics (age, sex)

Date and time of referral

Referral reason

Diagnostic category at ED presentation

Specialty to which the patient was referred

Clinical outcome at the receiving hospital

Diagnostic Categories

Based on presenting complaints and ED diagnoses, patients were classified into the following diagnostic groups:

Cardiac emergencies

Pulmonary emergencies

Neurological emergencies

Trauma-related emergencies

Non-traumatic surgical emergencies

Gastrointestinal emergencies

Metabolic emergencies

Gynecological emergencies

Infectious emergencies

Malignancy-related emergencies

Cases not fitting these categories were grouped as other emergencies, including urology, dermatology, and otolaryngology (ENT).

Temporal Analysis

To evaluate the association between referral patterns and time factors, referrals were analyzed according to:

Month of referral

Day of the week

Time of day, categorized into three intervals:

08:00–15:59

16:00–23:59

00:00–07:59

Outcome Measures

Clinical outcomes at the receiving hospitals were classified into four categories:

Discharged after treatment in the ED

Discharged after consultation with the relevant specialty

Hospitalized in the relevant department

Referred to another hospital due to reasons such as lack of bed capacity, specialist availability, or required medical equipment

Statistical Analysis

Statistical analyses were performed using IBM SPSS Statistics version 27. Descriptive statistics were used to summarize the study data. Categorical variables were expressed as frequencies and percentages, while continuous variables were summarized using median values with minimum and maximum ranges.

Associations between categorical variables were evaluated using the Pearson chi-square test or, when appropriate, the Fisher–Freeman–Halton exact test. Statistical significance was defined as a two-sided p-value of <0.05.

Results

During the study period between January 1, 2025, and July 1, 2025, a total of 29,156 patients presented to the ED. Among these, 502 patients (1.72%) were referred to other hospitals. After excluding patients younger than 18 years of age (n = 24), the final study population consisted of 478 adult patients referred to other healthcare institutions.

Demographic and Temporal Characteristics

The baseline demographic and temporal characteristics of the referred patients are summarized in Table 1. The median age of the study population was 72 years (range: 18–99), with a slight male predominance. Referrals occurred across all months, days of the week, and time intervals, with no statistically significant association observed between temporal variables and referral outcomes ($p > 0.05$).

Table 1. Demographic and temporal characteristics of referred patients

Variable	n	%
Gender		
Male	267	55.9
Female	211	44.1
Month		
January–March	216	45.2
April–June	262	54.8
Day of referral		
Weekday	416	87.0
Weekend	62	13.0
Time interval		
08:00–16:00	181	37.9
16:00–24:00	217	45.4
24:00–08:00	80	16.7

Diagnostic Groups and Referral Specialties

Diagnostic categories and referral specialty distributions are presented in Table 2. Cardiopulmonary emergencies constituted the largest diagnostic group among referred patients, followed by neurological and trauma-related emergencies. In terms of referral destinations, the majority of patients were referred to medical specialties, while a smaller proportion were referred to surgical specialties, diagnostic/administrative units, or directly to intensive care units.

Table 2. Distribution of referral reasons and receiving specialty groups

Category	n	%
Diagnostic groups		
Cardiopulmonary emergencies	225	47.1
Neurological emergencies	85	17.8
Trauma-related emergencies	79	16.5
Other emergencies	89	18.6
Referral specialty groups		
Medical specialties	338	70.7
Surgical specialties	112	23.4
Diagnostic / administrative	15	3.1
Intensive care	13	2.7

*Medical specialties: Cardiology, Neurology, Pulmonology, Internal Medicine, Gastroenterology, Nephrology, Hematology, Medical Oncology, Psychiatry, ENT, Obstetrics & Gynecology. †Surgical specialties: General Surgery, Orthopedics & Traumatology, Neurosurgery, Thoracic Surgery, Cardiovascular Surgery, Urology, Plastic Surgery, Hand Surgery. ‡Diagnostic/administrative: Emergency Medicine, Interventional Radiology

Outcomes of Referred Patients

Clinical outcomes according to referral specialty groups are presented in Table 3. Overall, most referred patients required hospitalization at the receiving institutions, with higher hospitalization rates observed among patients referred to intensive care units and medical specialties.

Outcome analysis by major diagnostic groups is summarized in Table 4. Hospitalization rates were comparable across diagnostic categories, and no statistically significant differences were identified.

No statistically significant associations were observed between gender and clinical outcomes. Similarly, referral outcomes did not differ significantly according to month, day of the week, or time interval.

Table 3. Distribution of hospitalization outcomes according to referral specialty groups

Referral specialty group	Hospitalized n (%)	Not hospitalized n (%)	Total
Medical specialties*	254 (75.1)	84 (24.9)	338
Surgical specialties†	75 (67.0)	37 (33.0)	112
Diagnostic / administrative‡	8 (53.3)	7 (46.7)	15
Intensive care	12 (92.3)	1 (7.7)	13
Total	349 (73.0)	129 (27.0)	478

*Medical specialties: Cardiology, Neurology, Pulmonology, Internal Medicine, Gastroenterology, Nephrology, Hematology, Medical Oncology, Psychiatry, ENT, Obstetrics & Gynecology. †Surgical specialties: General Surgery, Orthopedics & Traumatology, Neurosurgery, Thoracic Surgery, Cardiovascular Surgery, Urology, Plastic Surgery, Hand Surgery. ‡Diagnostic/administrative: Emergency Medicine, Interventional Radiology

Table 4. Hospitalization outcomes according to major diagnostic groups

Diagnostic group	Hospitalized n (%)	Not hospitalized n (%)	Total
Cardiopulmonary emergencies*	171 (76.0)	54 (24.0)	225
Neurological emergencies	59 (69.4)	26 (30.6)	85
Trauma-related emergencies	51 (64.6)	28 (35.4)	79
Other emergencies†	68 (76.4)	21 (23.6)	89
Total	349 (73.0)	129 (27.0)	478

*Cardiopulmonary: Cardiac and pulmonary emergencies. †Other emergencies: Gastrointestinal, Metabolic, Gynecological, Infectious, Malignancy, Non-traumatic surgical, Other

Discussion

This retrospective study evaluated interhospital referrals from the ED of a district state hospital and demonstrated several noteworthy findings. First, referrals constituted a relatively small proportion of total ED admissions, yet the majority of referred patients were subsequently hospitalized. Second, referrals were predominantly related to cardiopulmonary and neurological emergencies and were most frequently directed to medical specialties, particularly cardiology, neurology, and pulmonology. Third, temporal factors such as month, day of the week, and time of referral were not significantly associated with referral outcomes [1–3].

The proportion of referred patients among all ED admissions in this study was 1.72%, which is comparable to previously reported rates from district and secondary-level hospitals [2,4]. Similar studies conducted in Türkiye have shown that referrals from district hospitals represent a small but clinically significant subset of ED visits, often reflecting limitations in specialist availability and advanced diagnostic or therapeutic resources rather than excessive or inappropriate referral practices [4–6]. The relatively low referral rate observed in the present study suggests a generally efficient use of referral pathways in the studied ED.

Male patients constituted a slightly higher proportion of referrals than female patients. This finding is consistent with previous reports indicating higher referral rates among male patients, particularly in studies where trauma and cardiopulmonary emergencies constitute a substantial proportion of referrals [7,8]. Although the present study did not aim to investigate causal factors underlying gender differences, occupational exposure, trauma risk, and health-seeking behavior patterns may partially explain this observation [8].

Analysis of temporal patterns showed that referrals were most frequent during evening hours (16:00–23:59) and on weekdays, particularly Tuesdays. However, no statistically significant association was found between temporal variables and referral outcomes. This finding aligns with earlier studies reporting that, although referral volume may vary across different time periods, clinical outcomes are not necessarily influenced by referral timing [3,9]. These results suggest that referral decisions in the studied ED were primarily driven by clinical need rather than time-dependent operational factors.

Cardiopulmonary emergencies represented the largest diagnostic group among referred patients, followed by neurological and trauma-related emergencies. These findings are in line with national and regional studies indicating that cardiac, neurological, and respiratory conditions are the leading causes of interhospital referrals from EDs [2,5,10]. The

predominance of these diagnostic categories underscores the ongoing need for timely access to cardiology, neurology, and pulmonary services in district-level hospitals.

A key finding of this study was the high hospitalization rate among referred patients (73.0%). Hospitalization rates were particularly high for patients referred to intensive care units and medical specialties. This suggests that the majority of referrals were clinically justified and that referred patients generally required inpatient management at higher-level centers [6,9,11]. From a health system perspective, this finding supports the appropriateness of referral decisions made in the studied ED.

Outcome analysis by diagnostic group showed comparable hospitalization rates across major diagnostic categories. This observation may reflect the need for highly specialized surgical interventions, advanced imaging, or subspecialty trauma care that may not be readily available even at some referral centers [8,12]. These findings highlight the importance of strengthening regional trauma networks and ensuring appropriate distribution of specialized trauma services.

Overall, the results of this study suggest that interhospital referrals from the ED of a district state hospital are largely appropriate, clinically driven, and result in a high rate of hospital admission. Identifying the most common referral reasons and understanding outcome patterns may help guide resource planning, specialist allocation, and referral policy development aimed at improving the efficiency and safety of emergency care delivery [1,5,11].

Limitations

This study has several limitations that should be acknowledged. First, its retrospective design relies on the accuracy and completeness of electronic medical records, which may be subject to documentation bias. Second, the study was conducted at a single district state hospital operating as a Level I ED; therefore, the findings may not be fully generalizable to tertiary centers or hospitals with different resource availability and referral infrastructures. Third, although temporal variables such as month, day of the week, and time interval were analyzed, the absence of statistically significant associations with referral outcomes may be partly related to sample size limitations rather than a true lack of effect. Finally, clinical outcomes were assessed only at the receiving hospitals, and long-term patient outcomes following hospitalization or secondary referral could not be evaluated.

Conclusions

Interhospital referrals from the ED of a district state hospital in Türkiye constituted a small proportion of total ED admissions but were associated with a high rate of hospitalization, indicating clinically appropriate referral decisions. Referrals were predominantly related to cardiopulmonary and neurological emergencies and were mainly directed to medical specialties. The absence of significant temporal effects suggests that referral practices in the Turkish emergency care setting were driven primarily by clinical necessity rather than time-dependent factors. These findings provide region-specific evidence on ED referral patterns within Türkiye and may be relevant to similar emergency referral systems in middle-income countries.

Ethical Considerations

Ethical approval for this retrospective study was obtained from the Balıkesir Atatürk City Hospital Scientific Research Ethics Committee (Decision No: 2025/09/111). Due to the retrospective design of the study and the use of anonymized data, the requirement for informed consent was waived. All procedures were conducted in accordance with the principles of the Declaration of Helsinki.

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Conflict of Interest

The authors declare that they have no conflicts of interest related to this study.

Data Availability

The datasets generated and/or analyzed during the current study are available from the corresponding author upon reasonable request.

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