SMJ SAMSUN MEDICAL JOURNAL
Samsun Tıp Dergisi

SMJ 2025; 3(2): 36-45

Research Article

A PEDIATRIC EMERGENCY DEPARTMENT EXPERIENCE: CAUSES OF AMBULANCE USE

BİR ÇOCUK ACİL SERVİS DENEYİMİ: AMBULANS KULLANIM NEDENLERİ

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How to cite: Akça Ü, Akça G, Karatekin Ş. A Pediatric Emergency Department Experience: Causes of Ambulance Use. SMJ 2025; 3(2): 36-45.

Received : 25.11.2024
Accepted : 14.06.2025
Published: 30.08.2025

ABSTRACT

Objective: Interhospital patient referrals occur when patients require advanced medical care and treatment and the staff, equipment, and medico-technical facilities at the referring hospital are insufficient to meet these needs. The aim of this study is to comprehensively evaluate the demographic, clinical and referral process characteristics of patients referred to the pediatric emergency department via 112 emergency health services and referred to other health institutions from this unit.

Method: The demographic characteristics, time of admission, clinical complaints, inpatient services, referral centers, and reasons for referral were retrospectively analyzed in patients admitted to and referred from the pediatric emergency department of Samsun Training and Research Hospital between January 2023 and December 2023.

Results: A total of 873 patients (626 incoming and 247 outgoing) were included in the study. The mean age of the patients was 86.93±63.31 months. Most of the incoming patients (79.7%, n=499) were transferred without prior notification. The most common day of admission was Friday, the most common season was spring, and the most common shift was 16-24 hours. The majority of patients were referred for abdominal pain (26.7%, n=167), seizures (11.9%, n=75), and respiratory distress (8.9%, n=56). Of the presenting patients, 56.7% (355/626) were admitted to the hospital. The most common diagnoses among the transferred patients were seizure disorders (23.8%, n=59), traumatic injuries (8.9%, n=22), and oncologic conditions.

Conclusion: The referral chain plays a pivotal critical role in the management of pediatric emergencies. Deficiencies in communication and resources availability during the referral process may adversely affect impact the quality of patient care. Therefore, it is essential to standardize referral criteria, enhance in-service training for healthcare professionals, and implement structured health policies to ensure effective patient transfer and continuity of care.

Keywords: Ambulance, child emergency, prior notification, referral

ÖZET

Amaç: Hastaneler arası hasta sevkleri, hastaların ileri tıbbi bakım ve tedaviye ihtiyaç duydukları ve sevk eden hastanedeki personel, ekipman ve tıbbi-teknik imkânların ihtiyaçları karşılamakta yetersiz kaldığı durumlarda yapılmaktadır. Bu çalışmanın amacı, çocuk acil servisine 112 acil sağlık hizmetleri aracılığıyla sevk edilen ve yine bu birimden başka sağlık kuruluşlarına sevki gerçekleştirilen hastaların demografik, klinik ve sevk sürecine ilişkin özelliklerini kapsamlı şekilde değerlendirmektir.

Yöntem: Bu çalışmada, Ocak 2023 ile Aralık 2023 tarihleri arasında Samsun Eğitim ve Araştırma Hastanesi Çocuk Acil Servisine başvuran ve farklı merkezlere sevk edilen hastaların demografik özellikleri, başvuru zamanı, klinik şikayetleri, yatış yapılan servisler, sevk edildikleri sağlık kurumları ve sevk nedenleri retrospektif olarak incelendi.

Bulgular: Toplam 873 hasta (626 gelen, 247 giden) çalışmaya dahil edildi. Hastaların yaş ortalaması 86,93±63,31 aydı. Gelen hastaların %79,7'si (n=499) önceden bildirim yapılmadan gönderilmişti. En sık sevklerin cuma günü, ilkbahar mevsiminde ve 16.00–24.00 saatleri arasındaki vardiyada gerçekleştiği saptandı. En yaygın başvuru nedenleri karın ağrısı (%26,7; n=167), nöbet (%11,9; n=75) ve solunum sıkıntısı (%8,9; n=56) idi. Gelen hastaların %56,7'si (n=355) hastaneye yatırıldı. Sevk edilen hastalarda en sık görülen tanılar nöbet bozuklukları (%23,8; n=59), travmatik yaralanmalar (%8,9; n=22) ve onkolojik hastalıklar oldu.

Sonuç: Sevk zinciri, acil pediatrik hasta yönetiminin önemli bir bileşenidir. Sevk süreçlerinde yaşanan iletişim eksiklikleri ve kaynak yetersizlikleri, hasta bakım kalitesini doğrudan etkileyebilmektedir. Bu nedenle, sevk kriterlerinin standardize edilmesi, sağlık personeline yönelik hizmet içi eğitimlerin artırılması ve sistematik sağlık politikalarının geliştirilmesi gerekmektedir.

Anahtar Kelimeler: Ambulans, çocuk acil, ön bildirim, sevk

Introduction

Pediatric emergency departments (EDs) are dynamic units that serve patients aged 0–18 years, assessing illnesses and injuries that are acute or urgent (1). Over the past two decades, the number of critically ill patients presenting to the ED has increased, and the patterns of healthcare delivery have changed significantly during this period (2). Patients are referred between hospitals when they require advanced medical care and treatment and when the hospital where the patient is located lacks sufficient staff, equipment, and medical-technical facilities. In the presence of an effective referral system, this arrangement ensures that each patient receives the necessary care and that system resources are not wasted unnecessarily. The selection of patients to be referred to the next level of care and the provision of appropriate measures and conditions for their transfer are the key issues to be considered (Inpatient Service Communiqué) (3).

In studies conducted in various centers in Turkey, the rate of referrals between hospitals varies considerably, ranging from 0.5% to 35% of all referrals (4-9). While all emergency departments adhere to standardized protocols, various factors, including the physician staffing the department and the geographical characteristics of the region, influence the referral status of patients. Patients are referred to our tertiary-level, comprehensive hospital from surrounding districts and other provinces. Similarly, patients are referred to other medical facilities from the emergency department of our hospital. This study aimed to evaluate the characteristics of both incoming and outgoing patient referrals involving our hospital.

Materials and Methods

The hospital is located on a separate campus as an annex of Samsun Training and Research Hospital, which is affiliated with Samsun University. The medical staff includes gynecologists, obstetricians, pediatric surgeons, and numerous subspecialists, as well as pediatricians and residents. The objective of this study was to retrospectively evaluate pediatric patients who were referred to and from the pediatric emergency department. The study period extended from January 2023 to December 2023. Patients aged of 0 and 18 years whose complete data were accessible from hospital information system records and 112 patient registration forms were included in the study. The dataset comprised patients' chief complaints, dates and times of presentations to the emergency department (between 08:00-16:00, 16:00-24:00, 24:00-08:00), and outcomes (hospitalization to the ward or intensive care unit, or discharge from the outpatient clinic). The complaint, date, and time of presentation to the emergency department were analyzed in patients who were referred from the emergency department to other hospitals. The place of referral and the reason for referral were investigated.

Ethical Approval

This study was approved by the Clinical Research Ethics Committee of Samsun University (Approval No: GOKAEK/2024/6/8, Date: 01.04.2024).

Statistical Analysis

In this study, we employed a combination of descriptive and inferential statistical methods for data analysis, utilizing the statistical software package SPSS 23 (SPSS Inc., Chicago, IL, USA) for the statistical evaluation of the data. Descriptive variables were defined as mean ± standard deviation, while frequency variables were expressed as number and percentage. Categorical data that did not follow a normal distribution were analyzed using the Mann-Whitney U test. A p-value of less than 0.05 was considered statistically significant.

Results

Over the course of the one-year study period, a total of 280,136 children were evaluated in the emergency department. While 260 patients were referred to another medical facility from our hospital, 665 patients arrived at the emergency department via the 112-emergency medical services. Of the total number of patients, 0.23% of patients were referred out, and 0.09% were incoming transfers. The study included 247 outgoing patients and 626 incoming patients whose data entries and medical records were complete and accurate. Of the outgoing patients, 50.2% (n = 124) were female and 49.8% (n = 123) were male. Among the incoming patients, 42.7% (n = 267) were female and 57.3% (n = 359) were male, and no statistically significant difference was observed between the gender groups (p = 0.260).

The mean age of the patients was 82.96±69.81 months (range:1-210) for those who were referred, and 88.56±60.51 months (min:1 max 210) for those who were referred. Of the patients who were referred to the emergency department, 79.1% were referred from districts. The district with the highest rate of referral accounted for 18.2% of all referrals. The rate of referral from other hospitals in the provincial center was 6.4% (n=40) and 14.5% of patients came from other provinces. While prior notification was provided for 20.3% (n=127) of the incoming patients, 79.7% were referred without information in line with the decision of the Provincial Emergency Health Services Coordination Commission (PEHSCC).

The highest frequency of referrals was observed in May (11.5%, n=72), while the lowest frequency was noted in February (1%, n=6). Conversely, the highest frequency of referrals to other units was recorded in January (14.9%, n =37), while the lowest frequency was observed in October (4%, n = 10). The highest frequency of referrals was observed on Fridays, accounting for 16.8% (n = 105) of all referrals. Similarly, referrals from our hospital to other hospitals exhibited a peak on Fridays and Sundays, representing 16.5% (n = 41) of all referrals.

A review of the time of presentation to the emergency department revealed that 51% (n = 319) of the patients who were referred were admitted between 16 and 24 hours, while 16.9% (n = 106) were admitted between 24 and 8 hours. Similarly, 46.8% (n=116) of the patients who were referred were transferred to another medical facility, with the majority of these transfers occurring between 16-24 hours (n=116, 46.8%) and the minority occurring between 24-8 hours (n=34, 13.7%)(Table 1).

Table 1. Demographics and Admission Data of Pediatric Emergency Patients

	All cohort (n=873)	Incoming referrals (n=626)	Outgoing referrals (n=247)	p
Demographic information				
Age (m)*	86.93±63.31 (1-210)	88.43±60.60 (1-210)	83.11±69.68 (1-210)	0.264ǂ
Gender (female)Ɨ	390(44.7)	267(42.7)	123(49.8)	0.056§
Unannounced referral Ɨ	499(52.7)	499(79.7)a	0b	**<0.001§**

	All cohort (n=873)	Incoming referrals (n=626)	Outgoing referrals (n=247)	p
Demographic information				
Dates ǂ				
Monday	115(13.2)	95(15.2)	20(8.1)	0.186§
Tuesday	104(11.9)	71(11.3)	33(13.4)	
Wednesday	131(15.0)	94(15.0)	37(15.0)	
Thursday	117(13.4)	80(12.8)	37(15.0)	
Friday	146(16.7)	105(16.8)	41(16.6)	
Saturday	131(15.0)	93(14.9)	38(15.4)	
Sunday	129(14.8)	88(14.1)	41(16.6)	
Seasons ǂ				
Winter	185(21.2)	104(16.6)a	81(32.8)b	**<0.001§**
Spring	243(27.8)	193(30.8)a	50(20.2)b	
Summer	234(26.8)	168(26.8)a	66(26.7)a	
Fall	211(24.2)	161(25.7)a	50(20.2)a	
Shifts ǂ				
08-16	299(34.2)	201(32.1)	98(39.7)	0.197§
16-24	434(49.7)	319(51.0)	115(46.6)	
24-08	140(16.9)	106(16.9)	34(13.8)	

*:mean±SD(Min-Max), ǂ:Mann Whitney U Test, Ħn:(%), §: Chi-square Test.

Upon examining the referral locations, it was found that 77.8% (n = 193) were to other university hospitals in Samsun, 8.1% (n = 20) were to the Training and Research Hospital, and 10.9% (n = 27) were to private hospitals within the province. Abdominal pain was the most frequently reported symptom among the referred patients, affecting 26.7% (n = 167) of patients. Of these, 80 individuals were evaluated in the emergency department of our hospital and subsequently discharged as outpatients. A total of 87 patients were admitted to the hospital, including 75 patients in the pediatric surgery service, 11 patients in the pediatric ward, and one patient in the pediatric intensive care unit. The second most common reason for referral was seizure related. Of these patients, 75 were admitted for further treatment. Of the 39 patients discharged as outpatients, 35 were subsequently hospitalized in the pediatric ward. One patient was subsequently referred to their own health unit for further evaluation. The third most common complaint was respiratory distress, with a total of 56 patients being referred to our hospital with this diagnosis. Six of the patients were discharged from the facility as outpatients. Of the total number of patients, 51% (n=32) were hospitalized in the pediatric ward, 16 patients were hospitalized in the pediatric intensive care unit, and 2 patients were hospitalized in the neonatal intensive care unit.

The most common reasons for referral from the emergency department of our hospital were seizure (23.8%, n = 59), trauma (8.9%, n = 22), and respiratory distress (6.5%, n = 16). Among the incoming patients (n = 203), 32.4% were referred to the pediatric surgery department, 12.6% to neurology, 10.1% to cardiology, and 22.8% to general pediatrics. The proportion of patients who were evaluated and subsequently discharged as outpatients with a prescription was 42.2% (n = 264). The proportion of patients hospitalized in the pediatric ward was 34.7% (n: 217), 14.1% (n: 88) in the pediatric surgery ward, 6.5% (n: 41) in the pediatric intensive care unit, and 1.4% (n: 9) in the neonatal intensive care ward. The data regarding the number of referrals to and from our hospital, as well as the diagnoses and chief complaints of the patients, are presented in Tables 2 and 3 in detail.

Table 2. Evaluation of the diagnosis of patients presenting at the emergency department from external sources

	Outpatient discharges (n=264)	Inpatient service				Own	Total
		Children's service (n=217)	NICU (n=9)	PICU (n=41)	Pediatric surgery service (n=88)	Institution Referral (n=7)	(n=626)
Respiratory emergencyǂ							85(13.5)
Respiratory Distress	6(0.9)	32(5.1)	2(0.3)				
Pneumonia	5(0.8)	14(2.2)	-	8(1.3)	-	-	27(4.3)
Aspiration of Foreign Body	-	-	-	-	1(0.2)	1(0.2)	2(0.3)
Surgical emergencyǂ							182(29.1)
Abdominal Pain/Acute Abdomen	80(13.0)	11(1.7)	-	1(0.2)	75(12.0)	-	167(26.7)
Trauma	3(0.5)	-	-	-	-	2(0.3)	5(0.8)
Inguinal Hernia	1(0.2)	-	-	-	-	-	1(0.2)
Testicular Torsion	6(0.9)	1(0.2)	-	-	-	-	7(1.1)
Ruptured Ovarian Cyst	1(0.2)	-	-	-	1(0.2)	-	2(0.3)
Neurological emergencyǂ							92(14.7)
Seizure	39(6.2)	35(5.6)	-	-	-	1(0.2)	75(11.9)
Status Epilepticus	-	-	-	1(0.2)	-	1(0.2)	2(0.3)
Syncope	10(1.6)	-	-	-	-	-	10(1.6)
Cerebro vascular disease	-	1(0.2)	-	-	-	-	1(0.2)
Elevated Creatinkinase	1(0.2)	-	-	-	-	-	1(0.2)
Fascial Paralysis	1(0.2)	-	-	-	-	-	1(0.2)
Headache	2(0.3)	-	-	-	-	-	2(0.3)
Endocrinologic emergencyǂ							28(4.7)
Diabetic Ketoacidosis	1(0.2)	21(3.3)	-	6(0.9)	-	-	28(4.7)
Cardiological emergencyǂ							59(9.4)
Chest Pain	26(4.2)	8(1.3)	-	-	-	-	34(5.4)
SupraVentricularTachycardia	3(0.5)	1(0.2)	-	-	1(0.2)	-	5(0.8)
Myocarditis	3()	11(1.8)	-	1(0.2)	-	-	15(2.4)
Hypotension	1(0.2)	-	-	-	-	-	1(0.2)
Congenital Heart Disease	2(0.3)	2(0.3)	-	-	-	-	4(0.6)
Neonatological emergencyǂ							5(0.8)
Jaundice	-	-	4(0.6)	-	-	-	4(0.6)
Umbilical hernia	1(0.2)	-	-	-	-	-	1(0.2)
Gastroenterological emergencyǂ							64(10.2)
GI Bleeding	9(1.4)	11(1.8)	-	-	-	-	20(3.3)
Intussusception	10(1.6)	-	-	-	2(0.3)	2(0.3)	14(2.2)
Corrosive substance purchase	2(0.3)	3(0.5)	-	-	7(1.0)	-	12(1.9)
Anal Abscess	1(0.2)	-	-	-	-	-	1(0.2)
Foreign Body Ingestion	7(1.1)	1(0.2)	-	-	1(0.2)	-	9(1.4)
Pancreatitis	-	6(0.9)	-	-	-	-	6(0.9)

	Outpatient discharges (n=264)	Inpatient service				Own	Total
		Children's service (n=217)	NICU (n=9)	PICU (n=41)	Pediatric surgery service (n=88)	Institution Referral (n=7)	(n=626)
Cholecystitis	-	2(0.3)	-	-	-	-	2(0.3)
General and other Pediatric Emergencies‡							111(17.7)
Fever	15(2.4)	10(1.6)	3(0.5)	2(0.3)	-	-	30(4.8)
Drug intoxication	5(0.8)	18(2.9)	-	4(0.6)	1(0.2)	-	28(4.4)
Suicidal intoxication	-	8(1.3)	-	1(0.2)	-	-	9(1.4)
Alcohol intoxication	1(0.2)	-	-	-	-	-	1(0.2)
Dehydration/AGE	8(1.3)	8(1.3)	-	-	-	-	16(2.5)
Electric shock	-	3(0.5)	-	-	-	-	3(0.5)
Insect bite	-	1(0.2)	-	-	-	-	1(0.2)
Henoch-SchönleinPurpura	2(0.3)	2(0.2)	-	-	-	-	4(0.6)
Urinary tract infection	3(0.5)	2(0.3)	-	-	-	-	5(0.8)
Hydatid cyst	1(0.2)	-	-	-	-	-	1(0.2)
Anemia	3(0.5)	1(0.2)	-	-	-	-	4(0.6)
Allergy	4(0.6)	1(0.2)	-	-	-	-	5(0.8)
Renal failure	-	1(0.2)	-	-	-	-	1(0.2)
Nephrotic syndrome	1(0.2)	2(0.3)	-	-	-	-	3(0.4)

‡: n(%)

Table 3: Evaluation of the diagnoses of patients referred from our hospital to an external center

	Faculty of medicine (RMF)	TRH	Private hospital inprovince	Hyperbaric therapy center	Out-patient ICU	CMF	District hospital	Total (n=248)
Seizure	57	-	2	-	-	-	-	59
Trauma	8	14	-	-	-	-	-	22
Fever	6	-	9	-	-	-	1	16
Respiratory distress	9	1	5	-	1	-	-	16
Oncology Patient	14	-	-	-	-	-	-	14
Foreign Body Aspiration	13	-	-	-	-	-	1	14
Meningitis	10	-	-	-	-	-	-	10
Metabolic disease	8	-	-	-	-	1	-	9
VP Shunt Dysfunction	7	1	-	-	-	-	-	8
Chronic Renal Failure	8	-	-	-	-	-	-	8
Drug Intoxication	7	-	-	-	-	-	-	7
Neonatal respiratory distress	-	-	6	-	-	-	-	6
Anemia	6	-	-	-	-	-	-	6
Neonatal Jaundice	2	1	3	-	-	-	-	6

	Faculty of medicine (RMF)	TRH	Private hospital inprovince	Hyperbaric therapy center	Out-patient ICU	CMF	District hospital	Total (n=248)
Thrombocytopenia	6	-	-	-	-	-	-	6
Leukemia	5	-	-	-	-	-	-	5
Suicidal Intoxication	4	-	-	-	-	-	-	4
Hemiplegia	2	1	-	-	-	-	-	3
Urticaria	3	-	-	-	-	-	-	3
Cardiopulmonary Arrest	3	-	-	-	-	-	-	3
CO Poisoning	1	-	-	2	-	-	-	3
Neonatal cyanosis	-	-	2	-	-	-	-	2
Postoperative Appendicitis	2	-	-	-	-	-	-	2
Substance Abuse	2	-	-	-	-	-	-	2
Status Epilepticus	2	-	-	-	-	-	-	2
Battery Ingestion	1	-	-	-	-	-	-	1
Diplopia	1	-	-	-	-	-	-	1
Pericarditis	1	-	-	-	-	-	-	1
Testicular Torsion	-	1	-	-	-	-	-	1
Meckel's Diverticulum	1	-	-	-	-	-	-	1
Peritonsillar Abscess	1	-	-	-	-	-	-	1
Congenital Heart Disease	-	-	-	-	-	1	-	1
Blurred Consciousness	1	-	-	-	-	-	-	1
Diabetic Ketoacidosis	1	-	-	-	-	-	-	1
Abdominal Pain	-	-	-	-	-	-	1	1
Meningococcemia	1	-	-	-	-	-	-	1
GI Bleeding	1	-	-	-	-	-	-	1

CMF: Central Medical Faculty, RMF: Regional Medical Faculty, TRH: Training and Research Hospital,

Of the patients who were referred with prior notification, 7.1% (n = 9) were discharged after outpatient treatment following examination and investigation. The remaining patients were admitted to the following services: pediatric (53.5%, n = 68), pediatric intensive care (22.8%, n = 29), pediatric surgery (10.2%, n = 13), and neonatal intensive care (6.3%, n = 8).

Discussion

The present study provides a novel contribution to the literature on pediatric emergency department evaluation. While previous research has focused on either patients referred to the pediatric emergency department or patients referred from the emergency department, our study is the first to examine both groups concurrently.

The primary objective of the 112 Emergency Health Services is to provide a comprehensive and effective response to meet the vital needs of patients in life-threatening and/or urgent healthcare situations, including ensuring the prompt transportation of patients to the appropriate emergency facility. However, the utilization of this service for the referral and transfer of pediatric emergency patients at our hospital was observed to be markedly low. In the

United States of America, Jacob N. et al. found the rate of patients referred from the emergency department to be 1.8%, while Dana RK et al. found it to be 1.5% (10,11). In prior studies conducted in Turkey, the observed rate exhibited considerable variability, ranging from 0.5% to 35% (4-9). In our study, the rates of patients referred to the hospital via 112 (0.09%) or referred outside the institution (0.23%) were found to be relatively low in comparison to the literature. The fact that our hospital is a tertiary-level training and research hospital, and that a considerable number of subspecialty physicians are employed at the facility, suggests that the rate of referral to another hospital is relatively low. Concurrently, the number of patients arriving by referral is also distributed unevenly due to the presence of the medical faculty in the provincial center.

The majority of patients are referred from other districts. Despite an overall decrease in the number of referred patients over time, attributable to improvements in medical equipment, clinic capacity, unit availability, and the number of beds, districts have consistently remained the primary source of referrals. It is anticipated that patients will be referred from secondary hospitals to tertiary hospitals. A study on referrals from Eastern Black Sea hospitals revealed that the referral rate from districts was 68%, which aligns with our findings (12).

In a four-year study conducted by Karakaş et al., parental visits to the pediatric emergency department were evaluated (13). The results indicated that nearly half of the patients (49.4%) received outpatient prescriptions, while 47.7% were discharged with recommendations only, without a prescription. In another study, 82% of patients admitted to the pediatric emergency department were discharged without the need for observation following examination and, when necessary, prescription issuance (14). Approximately half of the patients who were also referred to our emergency department were discharged as outpatients. As reported by Snooks et al. in a meta-analysis, high discharge rates of patients brought by ambulance are indicative of inappropriate use of ambulances (15). In accordance with the aforementioned meta-analysis, the criteria for appropriate utilization of emergency department resources are as follows: the patient presents with a non-routine complaint, is not amenable to outpatient treatment, is admitted to the hospital, and is accepted as a non-routine patient. In this case, it would be appropriate to implement an increase in in-service training for medical professionals, with a particular focus on patients who may require further examination and treatment. Additionally, it would be beneficial to provide feedback to monitor the outcomes of patients who have been referred.

Upon evaluation of patients referred to other hospitals, it is observed that a significant proportion of these cases pertain to neurology. This phenomenon may be attributed to the absence of a neurology physician in the hospital, or alternatively, to the fact that the attending physician is the sole neurologist and is not on call. The majority of patients transferred from external medical facilities are related to neurology. These patients may have been referred due to the specialized nature of neurology, necessitating advanced examinations and treatments that can be performed at a higher level of care. The incidence of neurological emergencies is high, representing a significant proportion of admissions to pediatric emergency departments (16). In instances where there is a single specialist physician, Article 42 of the Inpatient Treatment Institutions Management Regulation stipulates that the physician is entitled to decline call duty outside of working hours. This is a fundamental right. (https://www.mevzuat.gov.tr/MevzuatMetin/3.5.85319.pdf) In settings with high patient turnover, the appointment of relevant branches by opening staff positions can be advantageous for both physicians and patients. Indeed, the study data indicated that the appointment of a pediatric neurology physician resulted in a notable reduction in the number of patients referred with neurological complaints.

In a study by Karakuş et al., the most common reasons for presentation to the emergency department were found to be multiple trauma (18.2%), chest pain (10.6%), pulmonary diseases (9.4%), and neurologic diseases (8%). The most common presenting diagnoses were related to trauma and neurology, which is consistent with the findings of previous studies in this area (17).

Despite its status as a third-level hospital, the facility saw a significant number of trauma patients who were subsequently referred elsewhere. While pediatric care is a field that necessitates the input of multiple specialists, our hospital specializes in only three areas: gynecology, pediatrics, and their respective sub-specialties. Consequently, patients requiring follow-up care from other branches are transferred to the hospital where those branches are located. Additionally, the pediatrics department does not primarily treat pediatric trauma patients. Incoming trauma patients are subsequently referred to the adult emergency department for further treatment. To circumvent such repetitive referrals, it is proposed that in-service training of 112 teams on hospital equipment in the province where they are located may prove beneficial to the process. At this juncture, the majority of referrals for trauma patients were due to the unavailability of branch physicians, such as those specializing in neurosurgery, orthopedics, and traumatology, who typically manage such cases within

our hospital. Additionally, the pediatric department does not typically provide care for trauma patients, regardless of the patient's age.

It is hypothesized that patients experiencing respiratory distress were referred for high-flow respiratory support, as existing devices were being utilized by other patients with respiratory distress, and intensive care beds were at full capacity.

The highest intensity of referrals between hospitals was observed on Fridays and Sundays. The most intensive day of referral to a university hospital was Friday, and a similar study found that Sunday was the most intensive day (18,19). The findings of our study indicate that the majority of referrals were made during the afternoon. As observed in the studies conducted by Erkuran and Çiftçi on emergency referrals, the majority of referrals were made in the afternoon. Similarly, in Güler's study, the majority of referrals were made in the evening (19-21). In order to circumvent potential issues that may emerge due to the influx of referrals in the latter half of the week and during the afternoon and evening hours, it is prudent to devise a contingency plan and ensure the availability of requisite equipment, vehicles, and personnel in sufficient numbers to mitigate the risk of adverse outcomes in the referral process.

Limitation

This study was conducted at a single center, and the data were retrospectively evaluated based solely on the information documented in medical records. This represents a potential limitation of the study.

Conclusion

The current state of healthcare services in our country is a significant concern, with emergency healthcare services requiring immediate attention. The patient transportation chain is a crucial component of the emergency system, particularly in the context of critical patient care. Although the number of referred patients is relatively low compared to the total number of admissions, strengthening the emergency infrastructure according to service demand, expanding in-service training, and providing supportive imaging for diagnosis in appropriate hospitals may help improve the current situation. These measures would ensure that patients are transferred to the most appropriate facility with the correct indication in a timely manner. It is our contention that these issues warrant greater emphasis in order to prevent the loss of time and service that patients would otherwise benefit from high-level health care.

REFERENCES

1. Frush K; American Academy of Pediatrics Committee on Pediatric Emergency Medicine. Preparation for emergencies in the offices of pediatricians and pediatric primary care providers. Pediatrics. 2007; 120(1):200–212.

2. Petruzella F, Easter JS. Pediatric emergency medicine literature 2020. Am J Emerg Med. 2021; 43:123-33.

3. A statement on the implementation procedures and principles of emergency services in inpatient healthcare facilities. The document was published in the Official Gazette (No. 31952) on September 13, 2022.

4. Kıdak L, Keskinoğlu P, Sofuoğlu T, Ölmezoğlu Z. Evaluation of the utilization of 112 Emergency Ambulance services in Izmir Province. J Gen Med. 2009; 19(3): 113- 119.

5. Zenginol, M., Al, B., Genc, S., Deveci, I., Yarbil, P., Ari Yilmaz, D., et al. Three-Year Operation Results of 112 Emergency Ambulances in Gaziantep Province. J Acad Emerg Med. 2011; 10(1), 27-32.

6. Önge, T., Satar, S., Kozaci, N., Acikalin, A., Koseoglu, Z., Gulen, M., Karakurt, U. Analysis of Adult Patients Brought to Emergency Medicine Service with 112. J Acad Emerg Med 2013;12(3), 150-154.

7. Kozan, Ergül. 2017. General Characteristics, Diagnosis and Evaluation of Patients Brought to the Emergency Department by Ambulance. Medical Specialization Thesis: University of Health Sciences, Istanbul.

8. Duran, M. (2015). 112 Kayseri Emergency Health Services 2013 Year Case Analysis. Medicine Specialization Thesis: Erciyes University Faculty of Medicine.

9. Özel G. (2019) Determination of factors affecting pediatric emergency department density. Medicine Specialization Thesis: Adıyaman University Faculty of Medicine.

10. Jacob N, Marlow M. Interhospital Transfers from U.S. Emergency Departments: Implications for Resource Utilization, Paient Safety, and Regionalization. Acad Emerg Med 2013; 20:888-93.

11. Dana RK, Ryan LM, Lara CS. Admit or Transfer? The Role of Insurance in hightransfer-Rate Medical Conditions in the Emergency Department. Ann Emerg Med. 2014;63(5):561-71.

12. Gönçer Demiral D, Özen Ü. Hastaneler arası hasta sevkleri: doğu karadeniz hastaneleri üzerine bir uygulama. J Manag Econ Res. 2020;18(4):190-208.

13. Karakas NM, Ozdemir B, Kilic S, Akbulut O. Reasons for PED Aplications of Parents: 4 Years Follow-Up, Osmangazi J Med. 2020;42(1):67-74.

14. Yıldız Y, Kanburoğlu MK. Çocuk Acil Servisinde Sağlık Hizmetleri Sunum Kalitesi ve Hasta Memnuniyeti. J Pediatr Emerg Intensive Care Med. 2021;8(1):7-14.

15. Snooks H, Wrigley H, George S, Thomas E, Smith H, Glasper A. Appropriateness of use of emergency ambulances. J Accid Emerg Med 1998; 15:212-5.

16. Kumandaş S, Canpolat M, editors. Pediatric neurological emergencies: diagnosis and treatment. Ankara: Akademisyen Publishing; 2022.

17. Karakus Yılmaz B, Yılmaz Karakuş B, Çevik E, Dogan H, Sam M, Kutur A. Emergency medical services (EMS) in a metropolitan area: A study from Istanbul. J Ist Faculty Med. 2014; 77(3), 37–40.

18. Ertan C, Akgün F, Yücel N. Analysis of referrals to the emergency department of a university hospital. Turk J Emerg Med. 2010;10(2):65-70.

19. Çiftçi, H, Topoyan, M. Evaluation of emergency department admissions at Dokuz Eylul University Hospital. In: Proceedings of the 3rd National Congress on Health Institutions Management; Izmir, Turkey. 1:1-22.

20. Erkuran MK, Duran A, Ocak T, Citisli V, Kaya H. The impact of the duration of admission to the emergency room on the mortality of intensive care patients. Niger J Clin Pract. 2014;17(3):320-323.

21. Güler S, Aksel G, Ayılgan FT, Özkan Hİ, Baz Ü, Orak Y. Evaluation of Emergency Interhospital Patient Transfers from Province of Mardin to Out-of-Province Hospitals in a Year. J Acad Emerg Med, 2014; 13: 62-6