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Investigation of Causes of Emergency Service Admission and Triage of the Newborn

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ABSTRACT
Objective: This study aimed to investigate the reasons for the emergency admission of the newborn. **Materials and Methods:** This study was conducted on the records of newborns aged 0-28 days (n=4212) admitted to the pediatric emergency department of a public hospital between 01.01.2020-31.12.2022. The analyses were performed using the SPSS 26.0 program. Descriptive data were presented as numbers, percentages, and mean, and categorical data were evaluated using the chi-square test. Significance level $p<0.05$ was accepted. **Results:** 28.9% (n=1217) of the applications were in 2020, 36.7% (n=1545) in 2021, and 34.4% (n=1450) in 2022. The number of applications increased in the fall months, and the most common diagnoses were healthy baby examinations and jaundice. Looking at the number of admissions over the years, it was determined that the number of 1-7-day admissions was higher in 2021 (χ^2=10.470, p=0.005), healthy infant examination showed a significant difference, jaundice was low in 2020, and admissions with restlessness and agitation increased in 2022 (χ^2=222.467, p=0.000). According to triage levels, it is seen that there are generally T3 applicants who receive a yellow area. In 2022, yellow area T2 applications increased, green area decreased in 2021, yellow area T3 increased in 2021 (χ^2=94.526; p=0.000), hospitalizations increased (χ^2=50.029, p=0.000), and deaths were high in 2020 (χ^2=7.388, p=0.025). **Conclusion:** Newborns use pediatric emergency departments significantly, and admissions increase, especially in the fall season. Admissions are generally more frequent due to healthy baby examinations and jaundice.
Keywords: Newborn, Emergency Service, Triage, Hospitalization.

Yenidoğanın Acil Servise Başvuru Nedenleri ve Triyaj İncelemesi

ÖZ
Amaç: Bu çalışmanın amacı yenidoğanın acil başvuru nedenlerinin incelenmesidir. **Gereç ve Yöntem:** Bu çalışma bir kamu hastanesi çocuk acil servisine 01.01.2020-31.12.2022 tarihleri arasında başvuran 0-28 günlük (n=4212) yenidoğanların kayıtları üzerinden gerçekleştirilmiştir. Analizler SPSS 26.0 programı kullanılarak, tanımlayıcı veriler sayı, yüzde ortalama ile sunulmuş, kategorik veriler ki kare testi kullanılarak değerlendirilmiştir. Anlamlılık düzeyi $p<0.05$ kabul edilmiştir. **Bulgular:** Başvuruların %28.9'u (n=1217) 2020 yılında, %36.7'si (n=1545) 2021 yılında, %34.4'ü (n=1450) 2022 yılında olmuştur. Başvurular sonbahar aylarında artış göstermekte, en sık görülen tanıların sağlıklı bebek muayenesi ve sarılık olduğu görülmektedir. Yıllar içinde başvurusu sayısına bakıldığında 2021 yılında 1-7 günlük başvuruların daha fazla olduğu (χ^2=10.470, p=0.005), sağlıklı bebek muayenesinin anlamlı farklılık gösterdiği, sarılığın ise 2020 yılında düşük olduğu, huzursuzluk, ajitasyon ile başvuruların 2022 yılında arttığı (χ^2=222.467, p=0.000) belirlenmiştir. Triyaj düzeylerine göre genellikle Sarı alan T3 başvurusunun olduğu görülmektedir. 2022 yılında sarı alan T2 başvuruların arttığı, yeşil alanın 2021 yılında düştüğü, 2021 yılında sarı alan T3 arttığı (χ^2=94.526; p=0.000) hastaneye yatışların arttığı (χ^2=50.029, p=0.000), 2020 yılında ölümlerin yüksek olduğu (χ^2=7.388, p=0.025), görülmektedir. **Sonuç:** Yenidoğanlar çocuk acil servislerini önemli ölçüde kullanmakta olup özellikle sonbahar mevsiminde başvurular artmaktadır. Başvurular sağlıklı bebek muayenesi ve sarılık nedeniyle başvurular daha sık olmaktadır.
Anahtar Kelimeler: Yenidoğan, Acil Servis, Triyaj, Hastaneye Yatış.

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INTRODUCTION

Although the newborn period includes the first 28 days of life (Bozlu et al., 2018; Ferreira et al., 2018; Eser et al., 2021), it is the period when the baby tries to adapt to extrauterine life, experiences physiological changes, and is the most vulnerable (Bozlu et al., 2018; Eser et al., 2021; Güneş et al., 2022). Most of the deaths observed in the first year of life occur during this period when the baby is vulnerable (Bozlu et al., 2018; Güneş et al., 2022). This period is characterized by high morbidity and mortality rates (Bozlu et al., 2018; Yang & Meng, 2019). Newborn morbidity and mortality rates reflect a country's socioeconomic development and health status and provide clues about the health system (Yang & Meng, 2019; Güneş et al., 2022). Newborn survival is closely related to access to health services. Most unpreventable events, such as congenital anomalies in developed countries, and preventable conditions, such as morbidity, infections, and preterm births in developing countries, affect newborn health (Yang & Meng, 2019). Within the scope of the Sustainable Development Goals, this critical issue affecting all countries is aimed at reducing the newborn mortality rate to at least 12 per 1000 live births in all countries by 2030 (United Nations, 2016). It is reported that newborns' emergency room visits increase disproportionately faster than older infants (Blakey et al., 2021; Turan et al., 2021). In a study conducted in Turkey, the rate of newborn admissions in the last 1 year was 1.5% of all pediatric admissions (Eser et al., 2021). In Bozlu et al. (2018) study, it was 1.9% and in Pervane et al. (2024) study, the rate of newborns brought to the hospital by 112 was found to be 0.01%. It is reported that 1.6% of pediatric emergency department admissions in Spain are newborns (Montero et al., 2021), and 2.5-5.7% of pediatric emergency department admissions in Italy are newborns (Silvagni et al., 2021). Parents generally prefer emergency departments when there is any problem with the newborn, whether urgent or not, during the newborn period (Bozlu et al., 2018). Although no pathologic cause is usually found in pediatric emergency department admissions of newborns, it is seen that they apply due to jaundice, bacterial infections, and other serious problems (Eser et al., 2021). Pediatric emergency departments are hospital units that provide uninterrupted 24-hour service (Karakaş et al., 2020), and healthcare professionals triage the applicants to determine the priority and appropriate treatment units. In triage, healthcare workers measure the vital signs of the newborn and ask the parents/caregivers who brought the newborn to the emergency department about the medical history of the baby, including the birth history and the reason for bringing the baby to the emergency department (Ministry of Health, 2022). The hospitalization rate is also higher in cases of readmission to the emergency department within the first 24-72 hours (Akçay & Gül, 2022). Hospitalization is a severe stressor for both the family and the infant and leads to an increase in health expenditures in countries. However, emergency room admissions can be prevented by anticipating possible risks and taking simple measures accordingly (Güneş et al., 2022). Examining the reasons that bring the newborn to the emergency department and evaluating the triage status is essential in providing evidence to decision-makers and healthcare professionals in the future. Although the use of health services by adults or children has been investigated, studies on the use of health services by newborns are limited (Bozlu et al., 2018; Eser et al., 2021).

This study aimed to examine the change in newborns admitted to the pediatric emergency department of a public institution over the years, frequency of admission, reasons for admission, and triage.

MATERIALS AND METHODS

Study group

This is a retrospective study based on the data of 0-28-day-old newborns (n=4212) admitted to the Pediatric Emergency Department of Istanbul Göztepe Prof. Dr. Süleyman Yalçın City Hospital between 01.01.2020-31.12.2022. In the study, the exclusion criteria were that the baby was not in the newborn period, there was missing data in the records, or could not be reached. No sampling was performed in the study, and all 0-28-day-old newborns admitted to the Pediatric Emergency Department of Istanbul Göztepe Prof. Dr. Süleyman Yalçın City Hospital between 01.01.2020 and 31.12.2022 who met the criteria were included in the study.

Dependent and independent variables

The study's dependent variables were newborn admissions by years and triage classification of admissions. Age, gender, diagnosis, hospitalization status, health insurance, nationality, forensic case status, and death status of the newborn were considered independent variables.

Procedures

The data were obtained through the patient information system with the hospital's permission. After the data were anonymized, the newborn emergency department visits between 01.01.2020 and 31.12.2022 were collected as a list.

Statistical analysis

The data obtained from the hospital were transferred to the Statistical Package for Social Science (SPSS) 26 program and analyzed. Descriptive data were presented with frequency, percentage, mean, and standard deviation values. The chi-square test was used in univariate analyses. Significance level $p<0.05$ was accepted.

Ethical considerations

In this study, the rules of the Declaration of Helsinki were followed, permission was obtained from the ethics committee of Balıkesir University Health Sciences Non-Interventional Research (Date: 06.12.2022, Approval No: 2022/118), and permission

was obtained from the chief physician of Istanbul Göztepe Prof. Dr. Süleyman Yalçın City Hospital (Date: 26.01.2023, Number: 2023/01).

RESULTS

The study group consisted of 4212 0-28-day-old applicants admitted between 01.01.2020 and 31.12.2022. Of these admissions, 28.9% (n=1217) occurred in 2020, 36.7% (n=1545) in 2021, and 34.4% (n=1450) in 2020. The study group's mean age (days) was 12.15±8.02, 11.84±8.23, and 12.71±8.33 in 2020, 2021, and 2022, respectively. The rates of newborns admitted at 0-7 days of age were 38.7%, 42.3%, and 36.6% in 2020, 2021, and 2022, respectively, while the rates of admission in the female gender were 50.0%, 49.5%, and 51.5%, respectively.

The most common diagnoses were healthy infant examination and jaundice. In 2020, 2021, and 2022, the rates for healthy baby examination were 44.4%, 36.5%, and 25.6%, respectively, while the rates for jaundice were 26.7%, 30.6%, and 32.1%, respectively. According to the triage levels, most of the admissions were Yellow area T3 (Vital signs are stable), which was 70.4%, 79.0%, and 68.1% in 2020, 2021, and 2022, respectively. In 2020, 2021, and 2022, hospitalization rates are 6.3%, 8.0%, and 13.9% respectively. The proportion of applicants with SSI was 97.5%, 96.4%, 97.2%, the proportion of applicants with Turkish citizenship was 98.3%, 98.0%, 98.2%, the proportion of applicants with forensic cases was 0.2%, 0.1%, 0.2%, and the proportion of applicants who died was 0.2% only in 2020 (Table 1).

Table 1. Sociodemographic characteristics of the study group (n=4212).

Variables	2020		2021		2022	
	X	SD	X	SD	X	SD
Age (Day)	12.15	8.02	11.84	8.23	12.71	8.33
	n	%	n	%	n	%
Age (Day)						
0-7	471	38.7	653	42.3	530	36.6
8-14	312	25.6	358	23.2	357	24.6
15-21	222	18.2	243	15.7	275	19.0
22-28	212	17.4	291	18.8	288	19.9
Gender						
Female	608	50.0	765	49.5	747	51.5
Male	609	50.0	780	50.5	703	48.5
Diagnosis						
Healthy baby examination	540	44.4	564	36.5	371	25.6
Jaundice	325	26.7	472	30.6	465	32.1
Restlessness, agitation	45	3.7	51	3.3	80	5.5
Fever	20	1.6	23	1.5	65	4.5
Urinary tract infections	11	0.9	8	0.5	10	0.7
Nutritional problems of the newborn	3	0.2	12	0.8	9	0.6
Aspiration of milk and food by the newborn	3	0.2	17	1.1	0	0.0
Conjunctivitis	15	1.2	13	0.8	19	1.3
Respiratory tract infections						
Acute upper respiratory tract infections	21	1.7	48	3.1	76	5.2
Cough	24	2.0	33	2.1	45	3.1
Gastrointestinal system causes						
Nausea, vomiting	38	3.1	41	2.7	31	2.1
Abdominal pain	21	1.7	22	1.4	41	2.8
Constipation	27	2.2	17	1.1	22	1.5
Intestinal gas and related conditions	18	1.5	32	2.1	14	1.0
Gastroenteritis and colitis non-infective	16	1.3	12	0.8	19	1.3
Dermatological causes						
Dermatitis	16	1.3	30	1.9	35	2.4
Soft tissue disorders	2	0.2	10	0.6	12	0.8
Bleeding related causes						
Umbilical hemorrhage	9	0.7	12	0.8	10	0.7
Bleeding	5	0.4	24	1.6	18	1.2
Other*	57	4.7	104	6.7	108	7.4
Triage level						
Red area T1	4	0.3	5	0.3	2	0.1
Yellow area T2 (vital signs impaired)	73	6.0	120	7.8	186	12.8
Yellow area T3 (Vital signs stable)	857	70.4	1220	79.0	987	68.1
Green area T4	283	23.3	200	12.9	275	19.0

Table 1 (Continued). Sociodemographic characteristics of the study group (n=4212).

Variables	2020		2021		2022	
	n	%	n	%	n	%
Hospitalization						
No	1140	93.7	1421	92.0	1249	86.1
Yes	77	6.3	124	8.0	201	13.9
Health insurance						
SSI	1187	97.5	1490	96.4	1409	97.2
Other**	30	2.5	55	3.6	41	2.8
Nationality of the applicant						
Turkish Citizen	1196	98.3	1514	98.0	1424	98.2
Other***	21	1.7	31	2.0	26	1.8
Forensic case						
Yes	2	0.2	1	0.1	3	0.2
No	1215	99.8	1544	99.9	1447	99.8
Death						
Yes	3	0.2	0	0.0	0	0.0
No	1214	99.8	1545	100.0	1450	100.0

X: Mean, **SD:** Standard deviation. * Myalgia, ileus, cystic fibrosis, cleft palate, thrombocytopenia, **Paid, temporary protection, health tourism, ***Syrian Arab Republic, Uzbekistan, Turkmenistan, Great Britain.

When the distribution of admissions by months in the research group is examined, it is seen that the total of 4212 admissions varied between 44-213 per month; there was an average of 117 newborn admissions per month, and admissions increased in the fall months (Figure 1).

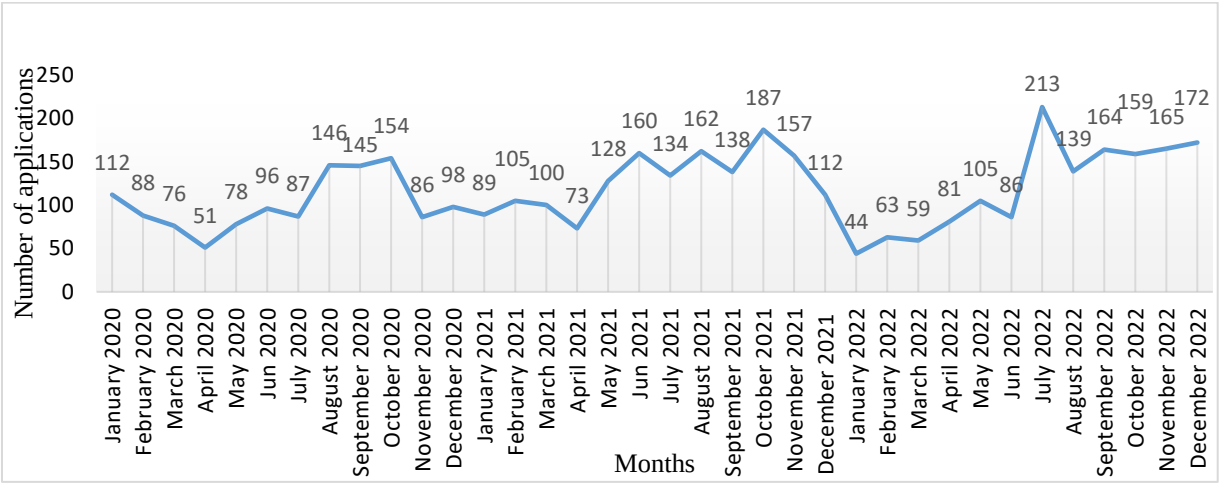

Figure 1. Number of examinations by month.

When the most common diagnoses in the study group are analysed, it is seen that the most common diagnoses are healthy baby examination and jaundice.When we look at the number of admissions in the research group over the years according to some variables, it is seen that 1-7 days old admissions were more in 2021 (χ^2=10.470, p=0.005), healthy infant examination showed a significant difference, jaundice was low in 2020, restlessness and agitation increased in 2022 (χ^2=222.467, p=0.000), according to triage, yellow area T2 (vital signs deteriorated) admissions increased in 2022, green area decreased in 2021, yellow area T3 (vital signs stable) increased in 2021 (χ^2=94.526, p=0.000) hospitalizations increased (χ^2=50.029, p=0.000), deaths were high in 2020 (χ^2=7.388, p=0.025). There is no statistically significant difference (p>0.05) according to gender, health insurance, nationality of the applicant, and forensic case status (Table 2).

Table 2. Changes in admissions over the years according to some sociodemographic variables (n=4212).

Variables	Year			Test value/p
	2020	2021	2022	
	n (%)	n (%)	n (%)	
Age				
1-7 days	471 (28.5)	653 (39.5)	530 (32.0)	χ^2=10.470
8-28 days	746 (29.2)	892 (34.9)	920 (36.0)	**p=0.005**
Gender				
Female	608 (28.7)	765 (36.1)	747 (35.2)	χ^2=1.296
Male	609 (29.1)	780 (37.3)	703 (33.6)	p=0.523
Diagnosis				
Healthy baby examination	540 (36.6)	564 (38.2)	371 (25.2)	
Jaundice	325 (25.8)	472 (37.4)	465 (36.8)	
Restlessness, agitation	45 (25.6)	51 (29.0)	80 (45.5)	
Hyperthermia (fever)	20 (18.5)	23 (21.3)	65 (60.2)	
Urinary tract infections	11 (37.9)	8 (27.6)	10 (34.5)	
Nutritional problems of the newborn	4 (16.0)	12 (48.0)	9 (36.0)	
Aspiration of milk and food by the newborn	3 (15.0)	17 (85.0)	0 (0.0)	
Conjunctivitis	15 (31.9)	13 (27.7)	19 (40.4)	
Acute upper respiratory tract infections	21 (14.5)	48 (33.1)	76 (52.4)	
Cough	24 (23.5)	33 (32.4)	45 (44.1)	χ^2=222.467
Nausea, vomiting	38 (34.5)	41 (37.3)	31 (28.2)	**p=0.000**
Abdominal pain	21 (25.0)	22 (26.2)	41 (48.8)	
Constipation	27 (40.9)	17 (25.8)	22 (33.3)	
Intestinal gas and related conditions	18 (28.1)	32 (50.0)	14 (21.9)	
Gastroenteritis and colitis non-infective	16 (34.0)	12 (25.5)	19 (40.4)	
Dermatitis	16 (19.8)	30 (37.0)	35 (43.2)	
Soft tissue disorders	2 (8.3)	10 (41.7)	12 (50.0)	
Umbilical hemorrhage	9 (29.0)	12 (38.7)	10 (32.3)	
Bleeding	5 (10.6)	24 (51.1)	18 (38.3)	
Other*	57 (21.2)	104 (38.7)	108 (40.1)	
Triage type				
Red area T1	4 (36.4)	5 (45.5)	2 (18.2)	χ^2=94.526
Yellow area T2 (vital signs impaired)	73 (19.3)	120 (31.7)	186 (49.1)	**p=0.000**
Yellow area T3 (Vital signs stable)	857 (28.0)	1220 (39.8)	987 (32.2)	
Green area T4	283 (37.3)	200 (26.4)	275 (36.3)	
Hospitalization				
No	1140 (29.9)	1421 (37.3)	1249 (32.8)	χ^2=50.029
Yes	77 (19.2)	124 (30.8)	201 (50.0)	**p=0.000**
Health insurance				
SSI	1187 (29.1)	1490 (36.5)	1409 (34.5)	χ^2=3.016
Other**	30 (23.8)	55 (43.7)	41 (32.5)	p=0.221
Nationality of the applicant				
Turkish citizen	1196 (28.9)	1514 (36.6)	1424 (34.4)	χ^2=0.338
Other***	21 (26.9)	31 (39.7)	26 (33.3)	p=0.845
Forensic case				
Yes	2 (33.3)	1 (16.7)	3 (50.0)	χ^2=1.121
No	1215 (28.9)	1544 (36.7)	1447 (34.4)	p=0.571
Death				
Yes	3 (100.0)	0 (0.0)	0 (0.0)	χ^2=7.388
No	1214 (28.8)	1545 (36.7)	1450 (34.4)	**p=0.025**

* Myalgia, ileus, cystic fibrosis, cleft palate, thrombocytopenia. **Paid, temporary protection, health tourism. ***SyrianArab Republic, Uzbekistan, Turkmenistan, Great Britain.

When we look at how the triage classification changed according to some variables in the research group, it was found that the number of newborns with T1 triage was low (χ^2=15.832, p=0.001), yellow area T2 (vital signs deteriorated) admissions increased in 2022 according to triage, green area decreased in 2021, yellow area T3 (vital signs stable) admissions increased in 2021 (χ^2=95. 711, p=0.000), jaundice was more common in T3, healthy infant examination was more common in T3, (χ^2=830.604, p=0.000), there were more hospitalizations in T4 compared to others (χ^2=1859. 567, p=0.000), forensic cases were

higher in T1 (χ^2=574.739, p=0.000), and deaths were higher in T1 (χ^2=511.614, p=0.000).

There is no statistically significant difference according to gender, health insurance, nationality of the applicant (p>0.05) (Table 3).

Table 3. Variation of Triage status according to some sociodemographic variables (n=4212).

Variables	Triage level				Test value/p
	T1	T2	T3	T4	
	n (%)	n (%)	n (%)	n (%)	
Age					
1-7 days	5 (0.3)	117 (7.1)	1247 (75.4)	285 (17.2)	χ^2=15.832
8-28 days	4 (0.2)	262 (10.2)	1817 (71.0)	475 (18.6)	**p=0.001**
Gender					
Female	3 (0.1)	184 (8.7)	1574 (74.2)	359 (16.9)	χ^2=5.757
Male	6 (0.3)	195 (9.3)	1490 (71.2)	401 (19.2)	p=0.124
Year of application					
2020	2 (0.2)	73 (6.0)	857 (70.4)	285 (23.4)	χ^2=95.711
2021	5 (0.3)	120 (7.8)	1220 (79.0)	200 (12.9)	**p=0.000**
2022	2 (0.1)	186 (12.8)	987 (68.1)	275 (19.0)	
Diagnosis					
Healthy baby examination	5 (0.3)	106 (7.2)	971 (65.8)	393 (26.6)	
Jaundice	1 (0.1)	46 (3.6)	1118 (88.6)	97 (7.7)	
Restlessness, agitation	0 (0.0)	18 (10.2)	137 (77.8)	21 (11.9)	
Fire	0 (0.0)	50 (46.3)	17 (15.7)	7 (24.1)	
Urinary tract infections	0 (0.0)	5 (17.2)	17 (58.6)	7 (24.1)	
Nutritional problems of the newborn	0 (0.0)	11 (44.0)	8 (32.0)	6 (24.0)	
Aspiration of milk and food by the newborn	1 (5.0)	7 (35.0)	4 (20.0)	8 (40.0)	
Conjunctivitis	0 (0.0)	1 (2.1)	45 (95.7)	1 (2.1)	
Acute upper respiratory tract infection	0 (0.0)	16 (11.0)	113 (77.9)	16 (11.0)	
Cough	0 (0.0)	13 (12.7)	66 (64.7)	23 (22.5)	χ^2=830.604
Nausea, vomiting	0 (0.0)	7 (14.9)	31 (66.0)	9 (19.1)	**p=0.000**
Abdominal pain	1 (1.2)	4 (4.8)	31 (36.9)	48 (57.1)	
Constipation	0 (0.0)	1 (1.5)	59 (89.4)	6 (9.1)	
Intestinal gas and related conditions	0 (0.0)	1 (1.6)	61 (95.3)	2 (3.1)	
Gastroenteritis and colitis non-infective	0 (0.0)	7 (14.9)	31 (66.0)	9 (19.1)	
Dermatitis	0 (0.0)	6 (7.4)	68 (84.0)	7 (8.6)	
Soft tissue disorders	0 (0.0)	2 (8.3)	21 (87.5)	1 (4.2)	
Umbilical hemorrhage	0 (0.0)	0 (0.0)	31 (100.0)	0 (0.0)	
Bleeding	0 (0.0)	2 (4.3)	43 (91.5)	2 (4.3)	
Other*	3 (1.1)	60 (22.3)	161 (59.9)	45 (16.7)	
Hospitalization					
Yes	2 (0.5)	12 (3.0)	0 (0.0)	388 (96.5)	χ^2=1859.567
No	7 (0.2)	367 (9.6)	3064 (80.4)	372 (9.8)	**p=0.000**
Patient nationality					
Turkish Citizen	9 (0.2)	367 (8.9)	3012 (72.9)	746 (18.0)	χ^2= 4.176
Other**	0 (0.0)	12 (15.4)	52 (66.7)	14 (17.9)	p=0.243
Social security					
SSI	8 (0.2)	364 (8.9)	2976 (72.8)	738 (18.1)	χ^2=3.439
Other***	1 (0.8)	15 (11.9)	88 (69.8)	22 (17.5)	p=0.329
Forensic case					
Yes	3 (50.0)	1 (16.7)	0 (0.0)	2 (33.3)	χ^2=574.739
No	8 (0.2)	378 (9.0)	3064 (72.8)	756 (18.0)	**p=0.000**
Death					
Yes	2 (66.7)	1 (33.3)	0 (0.0)	0 (0.0)	χ^2=511.614
No	9 (0.2)	378 (9.0)	3064 (72.8)	758 (18.0)	**p=0.000**

T1: Red area, T2: Yellow area (vital signs impaired), T3: Yellow area (vital signs normal), T4: Green area.
* Myalgia, ileus, cystic fibrosis, cleft palate, thrombocytopenia.
**SyrianArab Republic, Uzbekistan, Turkmenistan, Great Britain.
***Paid, temporary protection, health tourism.

DISCUSSION

Newborns are very vulnerable (Montero et al., 2021; Turan et al., 2021) and need continuous care. Parents should know sufficiently about newborn infant care (Turan et al., 2021). Newborns are admitted to the emergency department due to factors such as parental anxiety, and inadequate primary care support, early

postpartum discharge, and the number of newborns admitted to the emergency department is increasing (Batu et al., 2015; Ferreira et al., 2018; Turan et al., 2021). This study examined the reasons for newborns' admission to the emergency department. In our study, a change was observed in the emergency room visits of newborns over the years. This change may be related to the pandemic period. Notably, there were 3 newborn deaths in the year with the lowest hospitalization rate. During this period, applications to the emergency department may have been postponed due to practices such as curfews. While the hospitalization rate of newborns admitted to the emergency department was higher in our study compared to some studies conducted in our country (Akçay & Gül, 2022; Güneş et al., 2022; Karakaş et al., 2020), it is similar to some studies (Eser et al., 2021; Turan et al., 2021; Pervane et al., 2024). The variability of hospitalization rates in the studies may be due to differences in the reasons for admission. Emergency services are consulted when there is any problem related to the newborn, whether it is an emergency or not. In our study, similar to other studies, it was observed that most of the emergency department visits of our newborn babies were due to non-emergency reasons (Batu et al., 2015; Blakey et al., 2021; Ferreira et al., 2018; Pehlivanturk-Kizilkan et al., 2022; Turan et al., 2021). During emergency department visits, newborns may be exposed to a high risk of infection (Bonadio & Oliveira, 2019; Silvagni et al., 2021) and may increase the risk of transmission for other family members (Silvagni et al., 2021). In addition, nonurgent admissions can lead to patient overcrowding, stressful conditions for healthcare staff, and delays in care delivery. Consequently, they lead to less attention to urgent cases and create dissatisfaction among health professionals and service users (Morrison et al., 2014; Montoro-Pérez et al., 2023). However, every patient seen in the hospital generates a cost, regardless of the case's complexity, and the resources wasted on unnecessary admissions could be used for alternative investments to improve service quality (Bonadio & Oliveira, 2019). Regarding inappropriate use of the service, low health literacy of parents (Morrison et al., 2014; Montoro-Pérez et al., 2023), the impact of social networks, lack of fast access to computer services, and the advantages of pediatric emergency departments (PEDs) such as convenient working hours, accessibility, ease of diagnostic tests and consultation with specialists compared to outpatient services are seen as the reasons for emergency department visits (Montoro-Pérez et al. 2023).

Factors affecting the admission of newborns to the emergency department include primiparity, young maternal age, race, income, and education levels of the mother and father (Batu et al., 2015; Bonadio & Oliveira, 2019), lack of maternal income, (Pehlivanturk-Kizilkan et al., 2022), early postpartum discharge, being a single mother, caregivers having insufficient knowledge about the newborn, (Bonadio & Oliveira 2019; Montero et al., 2021), maternal occupation, premature birth, number of children, birth weight of the newborn (Montero et al., 2021). A study conducted in Brazil stated that using educational interventions for mothers in the delivery room reduces the number of emergency room visits of newborns (Bonadio & Oliveira 2019).

Neonatal hyperbilirubinemia (or neonatal jaundice) is a common condition in the newborn period, especially in the first 2 weeks of birth, and affects approximately 60-80% of newborns worldwide (Yan et al., 2022). In this study, the most common diagnoses in newborns admitted to the emergency department were healthy baby examination followed by jaundice, with 26.7%, 30.6%, and 32.1% in 2020, 2021, and 2022, respectively. Notably, while healthy infant examination has decreased over the years, jaundice has increased. In studies conducted in Izmir and Ankara, jaundice was determined as the most common diagnosis of newborn emergency department admission (Batu et al., 2015; Güneş et al., 2022; Pervane et al., 2024). In the study conducted by Batu et al. to determine the characteristics of PED visits in newborns (≤ 28 days old infants) and to evaluate the factors affecting them, the most common diagnoses were normal newborn, indirect hyperbilirubinemia, and infantile colic. It was reported that 23.2% of 531 infants were hospitalized, and 37.3% of the hospitalized infants had indirect hyperbilirubinemia, pneumonia, and sepsis (Batu et al., 2015). Smartphone applications have been shown to have satisfactory accuracy in screening newborn bilirubin levels. In a randomized controlled study involving 1187 mothers and infants in China, it was found that the intervention group using a smartphone-based out-of-hospital neonatal jaundice screening program reduced the rate of newborn readmission by 10.5% within 30 days from the first discharge compared to the control group and reduced the mean maternal anxiety score by 3.6 (Yan et al., 2022). In today's world, where technology is developing rapidly, the accessibility of smartphones and the increased use of web-based applications under the guidance of pediatricians in newborn health services can prevent emergency room admissions of newborns with non-acute causes.

When the distribution of admissions by season was examined, we found that newborns were more likely to apply to the emergency department in the fall season. In a retrospective study conducted in Izmir, it was also found that newborns were more likely to apply to the emergency department in the fall season (Güneş et al., 2022). As a result of the precautions, quarantine, and isolation procedures taken during the coronavirus disease pandemic, which was the period included in the study, it was thought that the frequency of viral infections in newborn babies decreased in the winter period, as in other children. A study in Italy concluded that newborn admissions to

the emergency department for feeding problems were frequent during the pandemic period and that this surprising data may be partly due to limited access to primary care services and, in addition, mandatory home isolation may limit the ability of inexperienced parents to seek advice from relatives and friends and increase anxiety and concerns about the best management for their infants (Silvagni et al., 2021). The Korean study showed that the COVID-19 pandemic affected the number of newborns visiting the emergency department, with a significant decrease in emergency department visits, especially for newborns 7 days old or younger (Lee et al., 2024). The younger the babies are admitted to the emergency department, the more likely they will be expected to be healthy newborns. Babies ≤ 14 days of age are reported to use the emergency department more, but this group usually does not require emergency care and has lower hospitalization rates. In a study conducted in Izmir, most of the patients (77.7%) were aged ≤ 14 days, and 72.9% did not have an emergency (Turan et al., 2021). Similarly, our study observed that newborns ≤7 days of age were frequently admitted according to years. Increased anxiety and fear of parents, early discharge after delivery, and lack of information about postnatal care may explain this situation. However, the triage ranking was higher in admissions older than 8 days. In a study examining the time of first admission of newborns to the emergency department in Portugal, it was reported that 85 newborns (32%) were admitted in the first week of life, 72 (27%) in the second week, and 61 (23%) in the third week (Ferreira et al., 2018). A retrospective study of newborn admissions to the pediatric emergency department in the U.K. found that the most common reasons for admission were difficulty in breathing, vomiting, and malnutrition. The most common diagnosis was 'no significant medical problem' (42%). Those with no significant medical problems were likelier to be <14 days old and had a lower triage category (Blakey et al., 2021).

Patients admitted to emergency departments are triaged by the healthcare personnel on duty to determine their medical priorities and the treatment units to which they will be directed, taking into account their complaints about their diseases, the severity of their symptoms, and the urgency of their medical conditions (Ministry of Health, 2022). This study shows that the yellow area admissions were the most common according to years. They were frequently referred to yellow areas with diagnoses such as jaundice, restlessness, agitation, and high fever. In a study conducted in Italy, it was reported that non-emergency admissions decreased during the pandemic period, while green (postponable emergency) and yellow area admissions (for emergency) increased (Silvagni et al., 2021).

Limitations and Strengths

One of the critical limitations of our study is that it was single-center, and the data were retrospectively obtained through the hospital information system. In the newborn period, factors belonging to the mother and factors belonging to the infant may also affect the rate of emergency department visits. Since not all detailed data on mothers were available in the data, we could not examine the extent to which maternal factors affect the rate of emergency department visits in our study.

CONCLUSION

In conclusion, our study shows that a significant proportion of cases in the neonatal period were brought to pediatric emergency departments within the first week, admissions due to jaundice increased over the years, and admissions with stable vital signs were more frequent. Because of these results, non-acute emergency department visits in our study were due to inadequate caregiver knowledge about newborn care. Educating parents and newborn caregivers about the conditions that should be referred to the emergency department and management of jaundice may prevent unnecessary visits to the emergency department and ensure the effective delivery of healthcare services. Increasing primary care support and making home visits in the first one-week period may be recommended.

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Conflict of Interest

The author states that there are no potential conflicts of interest regarding the research, authorship, or publication of this article.

Author Contributions

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Ethical Approval

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