Introduction

The emergency department (ED) is an essential component of the medical services offered in any hospital. Every year, EDs treat 130 million patients in the United States. Compared to other countries, Turkey shows an increasing number of ED admissions by less-urgent patients. This increasing trend causes doctors to spend less time with patients; moreover, it leads to a decrease in the quality of healthcare. Because their 24-hour service is a must to provide continuous care, EDs have been researched from various perspectives including design and triage models.

According to the Turkish Ministry of Health, while the total number of admissions to hospitals in Turkey was approximately 296 million during the first 9 months of 2017, pediatric emergency department (PED) admissions ranked 14th with a percentage of 3% (8 million). Similarly, according to the Turkish Pediatric Emergency and Intensive Care Association, pediatric patients account for 30% of all emergency admissions in 2008. It was reported that 4%–10% of all ED admissions are pediatric patients in the United States. How and why child and parental demographics, and their socioeconomic features including being fatherless and/or motherless, social security coverage, and having a primary care provider (PCP) were associated with increased PED use was well characterized. In addition, it was also shown that the quality of care in PCP was a key determinant.

Characteristics of pediatric emergency patients in a Turkish tertiary-level hospital: A 1-year cross-sectional study

Ayfer Yüksel

Abstract

Objectives: Overcrowding in pediatric emergency departments negatively affects the quality of care. Investigating the characteristics of the patients admitted to PEDs will provide valuable information to increase the satisfaction of patients and healthcare staff. This research aimed to investigate the characteristics of pediatric emergency patients in a foundation university hospital in Ankara.

Methods: This is a retrospective, descriptive, single-center, cross-sectional study, which was conducted with 6550 patients who were admitted to the pediatric emergency department of a foundation university hospital in Ankara, and got diagnosed with one of the 15 most common diseases between 1 August 2017 and 31 July 2018. The associations between the demographics and clinical features of the patients and their diagnoses were evaluated. For comparisons, frequencies, percentages, crosstabs, and chi-square tests were used.

Results: While none of the patients had a red triage level, 19% had a yellow triage level, and 81% had a green triage level. The three most common diagnoses were fever of unknown origin, cough, and nausea and vomiting. Despite the 0–28 days of age group having the lowest admission rate of 5%, they had the highest usage rate of yellow triage level (66.5%). However, it was the opposite for the 19 months to 5 years of age group with the highest rate of admissions of 49% and the lowest usage rate of yellow triage level (12.8%).

Conclusion: The reasons for admitting to pediatric emergency department differ according to some contextual variables. Being aware of the current situation is the first step in planning for better pediatric emergency service.

Keywords

Pediatric emergency department, pediatric patients, triage, diagnosis, age groups
of PED utilization since parents who were dissatisfied with the care of PCP are more likely to have a non-urgent ED visit.\textsuperscript{13}\textsuperscript{15} Because EDs are the first choice for admission to a hospital in many cases, ED utilization data are crucial for analysis.\textsuperscript{16} There were previous studies with adult ED cases in Turkey, though there is a limited number of research on the characteristics of the pediatric age group.\textsuperscript{17}\textsuperscript{20} PED admissions, which account for 30\% of all ED admissions, still maintain their high rate despite taking necessary measures.\textsuperscript{8} Although the primary purpose of the service in EDs is to provide urgent care for various health problems, they serve mostly non-urgent clinical conditions.\textsuperscript{21}\textsuperscript{22} ED usage for non-urgent conditions leads to increasing overcrowding in EDs, and decrease efficiency in treating patients who have serious and “real” emergent conditions.\textsuperscript{23}\textsuperscript{24} Overcrowding in EDs can cause long waiting times for emergent cases and poor outcomes including death.\textsuperscript{22}\textsuperscript{25} Therefore, it is essential to evaluate ED data to provide a better and more scientific healthcare service.\textsuperscript{8}

Briefly, the ultimate aim of this study was to evaluate the demographics and certain clinical features of pediatric emergency patients admitted to the PED of a foundation university hospital in Ankara for 1 year. It is expected that this study would contribute to the literature about PED usage, and guide decision-makers in improving the quality of care in emergency medicine.

Methods

Study design and setting

This study is a single-center, retrospective, descriptive, and cross-sectional study in which we studied the demographics and clinical features of pediatric emergency patients. The study was conducted in a tertiary-level hospital that is affiliated with a foundation university in Ankara. The hospital, which has been serving since 1999, has 221 beds, and the ED provides a 24-h uninterrupted service. Approximately 20\% of all admissions to the hospital are managed in the ED, which has an integrated radiology unit and surgical intervention room as well. While the patients aged 18 years and older are managed in the adult section of the ED, those under 18 years in the PED.

Sample size and patients

Because we intended to include all eligible patients in the study, we did not calculate an a priori sample size. Patients were evaluated for eligibility according to the inclusion criteria which are as follows: (1) admission to the ED between 1 August 2017 and 31 July 2018, (2) being under 18 years on the day of admission, and (3) diagnosing with one of the 15 most common diseases among all pediatric emergency admissions according to the International Classification of Diseases-10 (ICD-10) coding system. The frequency ranking of diseases was made overall admissions to the PED during the study period (from 1 August 2017 to 31 July 2018). We did not set any exclusion criterion, furthermore, the patients with missing data were also included in the study to obtain more accurate results.

Data and variables

The data were obtained from the electronic record system of the hospital using an electronic data sheet. Since the data collection form used in the study was not structured, no validation or pilot study of the form was conducted. The data consisted of the demographics of the patients (age and gender), date of admission, triage level, number of consultations to other clinics, need for hospitalization, need for surgery, prescriptions, and admission diagnosis codes according to ICD-10. The patients’ names were not obtained from the registration system.

The triage level was defined according to the three-level triage system of the ED, which was put into practice by the Turkish Ministry of Health in 2009.\textsuperscript{26} These three levels are as follows: (1) green for third-degree priority, and not requiring urgent attention, (2) yellow for second-degree priority, and requiring attention within an hour, and (3) red for first-degree priority, and requiring immediate intervention.

Ethical considerations

Due to the retrospective nature of this study, it was not able to obtain written informed consent from the patients. Not only this issue but also not gathering any personal data from the patients were stated on the application form to Ufuk University Scientific Research and Publication Ethics Committee, and it was waived by the committee by its approval dated 28 December 2020 and numbered 202/54.

Statistical analysis

Statistical analyses were carried out via the IBM SPSS version 23 software. The associations between categorical variables were examined using the chi-square test. Post-hoc pairwise comparisons were done using post-hoc Z test with Bonferroni correction.\textsuperscript{27} A p value of 0.05 was set as the statistical significance threshold.

Results

Of the 26,552 patients admitted to the ED between 1 August 2017 and 31 July 2018, 16,383 were adults, and 10,169 were pediatric emergency patients. Of those pediatric patients, 6550 who got diagnosed with one of the 15 most common diseases were included in the study. Of those 6550 patients, 46.2\% (n=3027) were female, and 53.8\% (n=3523) were male (Table 1).
Table 1 shows the demographics of the patients. While infants aged 0–28 days had the lowest admission rate of 5.4%, the 19 months to 5 years of age group had the highest rate of 49.1% (Table 1).

| Gender | Male | 3523 | 53.8 |
|--------|------|------|------|
| Female | 3027 | 46.2 |

| Age            | n   | %  |
|----------------|-----|----|
| 0–28 days      | 355 | 5.4|
| 29 days–18 months | 784 | 12.0|
| 19 months–5 years | 3213 | 49.1|
| 6–11 years     | 1458 | 22.3|
| 12–18 years    | 736  | 11.2|

There was a statistically significant association between seasons and admission diagnoses (p < 0.05). The three most common diagnoses were fever of unknown origin (FUO), cough, and nausea and vomiting. FUO was statistically significantly diagnosed more frequently during winter and summer compared to spring (p < 0.05). Cough was most commonly diagnosed during winter (23.1%), and the least during summer (9.3%) (p < 0.05). Nausea and vomiting were statistically significantly more common during summer and fall compared to the other seasons (p < 0.05) (Table 2).

As shown in Table 3, there was a statistically significant association between gender and diagnoses (p < 0.05). The prevalence of the three most common diagnoses, FUO, cough, and nausea and vomiting, were statistically similar between males and females (p > 0.05). However, abdominal and pelvic pain and acute tonsillitis were statistically

| Diagnosis                              | Winter | Spring | Summer | Fall | Total |
|----------------------------------------|--------|--------|--------|------|-------|
| R50—Fever of unknown origin            | n      | %      |        |      |       |
|                                        | 745a   | 34.4   | 369a   | 428b | 1858  |
| R05—Cough                              | n      | %      |        |      |       |
|                                        | 508a   | 23.4   | 112c   | 313b | 1186  |
| R11—Nausea and vomiting                | n      | %      |        |      |       |
|                                        | 94a    | 4.3    | 167c   | 229c | 593   |
| R10—Abdominal and pelvic pain          | n      | %      |        |      |       |
|                                        | 124a   | 5.7    | 80a,b  | 166b | 459   |
| J06—Multiple acute upper respiratory tract infections of unspecified locations | n   | %    |       |      |       |
|                                        | 176a   | 8.1    | 4.9    | 6.5  | 6.9   |
| W19—Falling, unspecified               | n      | %      |        |      |       |
|                                        | 93a    | 4.3    | 8.4    | 7.3  | 6.7   |
| H66—Suppurative and unspecified otitis media | n | %    |        |      |       |
|                                        | 145a   | 6.7    | 4.1    | 5.4  | 324   |
| R07—Throat and chest pain              | n      | %      |        |      |       |
|                                        | 90b,c  | 4.2    | 6.6    | 2.7  | 4.7   |
| R17—Jaundice, unspecified              | n      | %      |        |      |       |
|                                        | 33a    | 1.5    | 2.8    | 2.9  | 2.3   |
| R21—Redness and other unspecified skin rash | n | %     |        |      |       |
|                                        | 35a    | 1.6    | 2.7    | 2.5  | 2.1   |
| P59—Neonatal jaundice due to other, unspecified causes | n | % |        |      |       |
|                                        | 30a    | 1.4    | 3.3    | 2.2  | 2.0   |
| R45—Emotional signs and symptoms       | n      | %      |        |      |       |
|                                        | 26a    | 1.2    | 4.4    | 1.2  | 2.0   |
| J03—Acute tonsillitis                  | n      | %      |        |      |       |
|                                        | 31a    | 1.4    | 3.7    | 2.9  | 2.0   |
| M79—Other soft tissue disorders, unclassified | n | % |        |      |       |
|                                        | 16a    | 0.7    | 4.3    | 2.4  | 1.9   |
| K52—Other non-infective gastroenteritis and colitis | n | % |        |      |       |
|                                        | 22a    | 1.0    | 2.6    | 2.6  | 1.8   |
| Total                                  | n      | %      |        |      |       |
|                                        | 2168   | 100.0  | 100.0  | 100.0| 100.0 |

Chi-square = 584.14; df = 42; p = 0.001.

* Season categories without statistically significant difference (Bonferroni correction).
significantly more frequent in females than males (p < 0.05). Falling and other non-infective gastroenteritis and colitis, on the contrary, were more common in males (p < 0.05).

There were again some statistically significant correlations between the patients’ age groups and triage levels (p < 0.05). The yellow triage level was most common in infants 0–28 days old (66.5%), and least common in patients aged between 19 months and 5 years (12.8%) (Table 4).

Table 5 illustrates the association between age and admission diagnosis. There was a statistically significant association between the patients’ age groups and triage levels (p < 0.05). The yellow triage level was most common in infants 0–28 days old (66.5%), and least common in patients aged between 19 months and 5 years (12.8%) (Table 4).

Table 3. Association between gender and admission diagnosis.

| Diagnosis                      | Gender | Total       |
|--------------------------------|--------|-------------|
|                                | Male   | Female      |
| R50—Fever of unknown origin    | 999    | 859         | 1858       |
| R05—Cough                      | 639    | 547         | 1186       |
| R11—Nausea and vomiting        | 299    | 294         | 593        |
| R10—Abdominal and pelvic pain  | 219    | 240         | 459        |
| J06—Multiple acute upper       | 247    | 206         | 453        |
| respiratory tract infections    | 7.0    | 6.8         | 6.9        |
| of unspecified locations        |        |             |            |
| W19—Falling, unspecified       | 272    | 164         | 436        |
| H66—Suppurative and unspecified | 181    | 143         | 324        |
| unspecified otitis media        | 5.1    | 4.7         | 4.9        |
| R07—Throat and chest pain      | 151    | 160         | 311        |
| R17—Jaundice, unspecified      | 88     | 62          | 150        |
| R21—Redness and other          | 82     | 58          | 140        |
| unspecified skin rash          | 2.3    | 1.9         | 2.1        |
| P59—Neonatal jaundice due to    | 74     | 59          | 133        |
| other, unspecified causes      | 2.1    | 1.9         | 2.0        |
| R45—Emotional signs and        | 63     | 70          | 133        |
| symptoms                       | 1.8    | 2.3         | 2.0        |
| J03—Acute tonsillitis          | 58     | 71          | 129        |
| M79—Other soft tissue disorders,| 75     | 49          | 124        |
| unclassified                    | 2.1    | 1.6         | 1.9        |
| K52—Other non-infective        | 76     | 45          | 121        |
| gastroenteritis and colitis     | 2.2    | 1.5         | 1.8        |
| Total                          | 3523   | 3027        | 6550       |

Chi-square = 41.94; df = 14; p < 0.001.

Discussion

The main objective of this study was to investigate the demographics and clinical characteristics of the pediatric patients who presented with the 15 most common diseases diagnosed in the PED of a foundation university hospital in Ankara during the study period. Patients’ data were extracted from the electronic patient records of the hospital. Although it was stated that there were deficiencies in hospital registry systems from which patient data were obtained, it is still one of the most reliable data sources.

A slightly higher male ratio was reported in the studies with pediatric emergency patients in Turkey. However, it was reported that the gender distribution varies from country to country, and according to the characteristics of the society. In a systematic review, the urgent and non-urgent admission to EDs was found similar in male and female gender. Polat et al. reported that soft-tissue injury (62%), poisoning (75%), and burns (63%) were more common in male patients, while foreign body aspiration (66.7%) was more common in females. However, the three most common diagnoses (FUO, cough, and nausea and vomiting) did not differ between male and female patients in our study. While abdominal and pelvic pain and acute tonsillitis were diagnosed more in females, falling, unspecified, and other non-infective gastroenteritis and colitis were more frequent in males. Although the male gender ratio was slightly higher in the published studies, further studies were needed to explain the effects of gender on admission to EDs.

Regarding the frequency of diagnoses, Polat et al. reported soft-tissue injury as the most common reason for admission to a PED in Erzurum. Karakas et al. on the contrary, found that fever (22%), cough (16%), and nausea-vomiting (10%) were the three most common principal diagnoses in a PED in Ankara. Similarly, in our study, the
### Table 4. Association between age and triage level.

| Triage level | Age          | Total |
|--------------|--------------|-------|
|              | 0–28 days | 29 days–18 months | 19 months–5 years | 6–11 years | 12–18 years |
| Green        | 119<sup>a</sup> | 644<sup>b</sup> | 2801<sup>c</sup> | 1198<sup>b</sup> | 544<sup>d</sup> | 5306 |
|              | 33.5% | 82.1% | 87.2% | 82.2% | 73.9% | 81.1% |
| Yellow       | 236<sup>e</sup> | 140<sup>b</sup> | 412<sup>c</sup> | 260<sup>b</sup> | 192<sup>d</sup> | 1240 |
|              | 66.5% | 17.9% | 12.8% | 17.8% | 26.1% | 18.9% |
| Total        | 355 | 784 | 3213 | 1458 | 736 | 6546 |
|              | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |

Chi-square = 627.05; df = 4; p < 0.001

*<sup>a</sup>, *<sup>b</sup>Age categories without statistically significant difference (Bonferroni correction).

### Table 5. Association between age and admission diagnosis.

| Diagnosis                                                        | Age          | Total |
|-----------------------------------------------------------------|--------------|-------|
|                                                                | 0–28 days | 29 days–18 months | 19 months–5 years | 6–11 years | 12–18 years |
| R50—Fever of unknown origin                                     | 24<sup>a</sup> | 279<sup>b</sup> | 1141<sup>b</sup> | 326<sup>c</sup> | 88<sup>d</sup> | 1858 |
|                                                                | 6.8% | 35.6% | 35.5% | 22.4% | 12.0% | 28.4% |
| R05—Cough                                                      | 12<sup>e</sup> | 243<sup>b</sup> | 683<sup>c</sup> | 203<sup>d</sup> | 45<sup>e</sup> | 1186 |
|                                                                | 3.4% | 31.0% | 21.3% | 13.9% | 6.1% | 18.1% |
| R11—Nausea and vomiting                                       | 7<sup>f</sup> | 43<sup>b</sup> | 276<sup>b</sup> | 153<sup>b</sup> | 114<sup>c</sup> | 593 |
|                                                                | 2.0% | 5.5% | 8.6% | 10.5% | 15.5% | 9.1% |
| R10—Abdominal and pelvic pain                                  | 3<sup>f</sup> | 7<sup>f</sup> | 137<sup>b</sup> | 188<sup>d</sup> | 124<sup>c</sup> | 459 |
|                                                                | 0.8% | 0.9% | 4.3% | 12.9% | 16.8% | 7.0% |
| J06—Multiple acute upper respiratory tract infections of unspecified locations | 7<sup>f</sup> | 52<sup>b</sup> | 248<sup>b</sup> | 91<sup>b</sup> | 55<sup>b</sup> | 453 |
|                                                                | 2.0% | 6.6% | 7.7% | 6.2% | 7.5% | 6.9% |
| W19—Falling, unspecified                                       | 0<sup>f</sup> | 28<sup>b</sup> | 114<sup>b</sup> | 172<sup>c</sup> | 122<sup>d</sup> | 436 |
|                                                                | 0.0% | 3.6% | 3.5% | 11.8% | 16.6% | 6.7% |
| H66—Suppurative and unspecified otitis media                    | 0<sup>f</sup> | 7<sup>f</sup> | 236<sup>b</sup> | 69<sup>d</sup> | 12<sup>e</sup> | 324 |
|                                                                | 0.0% | 0.9% | 7.3% | 4.7% | 1.6% | 4.9% |
| R07—Throat and chest pain                                       | 0<sup>f</sup> | 0<sup>f</sup> | 126<sup>e</sup> | 118<sup>e</sup> | 67<sup>e</sup> | 311 |
|                                                                | 0.0% | 0.0% | 3.9% | 8.1% | 9.1% | 4.8% |
| R17—Jaundice, unspecified                                      | 144<sup>a</sup> | 3<sup>b</sup> | 2<sup>b</sup> | 0<sup>b</sup> | 0<sup>b</sup> | 149 |
|                                                                | 40.6% | 0.4% | 0.1% | 0.0% | 0.0% | 2.3% |
| R21—Redness and other unspecified skin rash                    | 3<sup>a</sup> | 23<sup>a</sup> | 72<sup>a</sup> | 31<sup>a</sup> | 11<sup>a</sup> | 140 |
|                                                                | 0.8% | 2.9% | 2.2% | 2.1% | 1.5% | 2.1% |
| P59—Neonatal jaundice due to other, unspecified causes          | 127<sup>a</sup> | 3<sup>b</sup> | 0<sup>c</sup> | 0<sup>b</sup>,<sup>c</sup> | 0<sup>b</sup>,<sup>c</sup> | 130 |
|                                                                | 35.8% | 0.4% | 0.0% | 0.0% | 0.0% | 2.0% |
| R45—Emotional signs and symptoms                                | 27<sup>b</sup> | 76<sup>a</sup> | 26<sup>b</sup> | 3<sup>b</sup> | 1<sup>b</sup> | 133 |
|                                                                | 7.6% | 9.7% | 0.8% | 0.2% | 0.1% | 2.0% |
| J03—Acute tonsillitis                                           | 0<sup>b</sup>,<sup>c</sup> | 1<sup>b</sup> | 67<sup>a</sup>,<sup>c</sup> | 39<sup>d</sup> | 22<sup>e</sup> | 129 |
|                                                                | 0.0% | 0.1% | 2.1% | 2.7% | 3.0% | 2.0% |
| M79—Other soft tissue disorders, unclassified                   | 0<sup>e</sup> | 3<sup>a</sup> | 28<sup>a</sup> | 41<sup>b</sup> | 52<sup>c</sup> | 124 |
|                                                                | 0.0% | 0.4% | 0.9% | 2.8% | 7.1% | 1.9% |
| K52—Other non-infective gastroenteritis and colitis             | 1<sup>a</sup> | 16<sup>b</sup> | 57<sup>b</sup> | 24<sup>b</sup> | 23<sup>b</sup> | 121 |
|                                                                | 0.3% | 2.0% | 1.8% | 1.6% | 3.1% | 1.8% |
| Total                                                           | 355 | 784 | 3213 | 1458 | 736 | 6546 |
|                                                                | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |

Chi-square = 6354.3; df = 56; p < 0.001

*<sup>a</sup>, *<sup>b</sup>,<sup>c</sup>Age categories without statistically significant difference (Bonferroni correction).
In our study, FUO was diagnosed more during winter and summer, cough during winter, and nausea and vomiting during summer and fall. Anil et al. reported that the admissions to PEDs had increased in winter, and decreased in summer. Similarly, Temizkan et al. showed the number of admission to PEDs increased during the winter months. In addition, it was demonstrated that the frequency of upper respiratory tract infection increased in the winter months, and trauma cases increased in the spring and summer months. In a systematic review, it was reported that the frequency of ED admission was highest in spring and lowest in winter. However, the seasonal variations in childhood diseases, as opposed to adult diseases, might affect the admission diagnosis in pediatric patients.

Although Cevik and Tekir reported a consultation rate of 0.27% among all age group emergency patients, Yüksel found that 12.5% of adult emergency patients received a consultation. The higher consultation rate in adults might explain why our study population’s consultation rate was 3.2%. Polat et al. reported that only 3% of their study group were hospitalized. Karakas et al. highlighted that 49% of the patients were given outpatient treatment with a prescription, 48% were discharged without a prescription, and approximately 2% were hospitalized. In our study, 95% of the patients did not receive any prescription, 4% were hospitalized, and none of them underwent surgery. The hospitalization rates in our study appear to be similar to the literature.

In Turkey, as in other countries, PEDs are the only healthcare settings that provide 24 h service to pediatric patients. In addition to the impossibility of receiving healthcare on weekends and holidays, and within out of hours, parents seeking fast and effective healthcare for their children lead to overcrowding of these units. The very high numbers of non-urgent admissions to EDs, most of whom can be treated in primary care or outpatient clinics, and the huge amount of discharged patients after initial basic management, address the fact that these units are used for reasons other than clinical situations that require emergency health care.

### Limitations

The first limitation of our study was the lack of sample size calculation. We did not calculate an a priori minimum required sample size to include more patients in the study. Because the data of this research is limited to 1-year data of a foundation university hospital in Ankara, our findings may differ in smaller cities or public hospital PEDs. It should also be considered that there may be differences in terms of pediatric emergency admissions between the COVID-19 pandemic era and past years.

### Conclusion

Being aware of the current situation is the first step in planning for pediatric emergency service. The non-urgent admission to PEDs, almost all of which can be treated in primary care and outpatient clinics, is a major challenge. Therefore, decision-makers should consider not only improving the
quantities but also alternative approaches including strengthening primary care, employing a referral system, and raising the awareness of parents about the proper use of PED to manage this challenge successfully.

Acknowledgements
The author thanks Ufuk University Dr. Rıdvan Ege Hospital administrators for their unreserved support and cooperation.

Author contributions
The whole article was prepared by A.Y.

Availability of data and materials
The data set used and/or analyzed during this study are available from the corresponding author upon reasonable request.

Declaration of conflicting interests
The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical approval
This study was approved by Ufuk University Scientific Research and Publication Ethics Committee (dated 28 December 2020 and numbered 202/54).

Funding
The author(s) received no financial support for the research, authorship, and/or publication of this article.

Informed consent
Due to the retrospective nature of this study, it was not able to obtain written informed consent from the patients. Not only this issue but also not gathering any personal data from the patients were stated on the application form to Ufuk University Scientific Research and Publication Ethics Committee, and it was waived by the committee by its approval dated 28 December 2020 and numbered 202/54.

Publication ethics
The material presented in this manuscript has not been published before nor has it been submitted for publication to another scientific journal or being considered for publication elsewhere.

ORCID iD
Ayfer Yüksel https://orcid.org/0000-0003-3140-1432

Supplemental material
Supplemental material for this article is available online.

References
1. Rothman RE, Irvin CB, Moran GJ, et al. Respiratory hygiene in the emergency department. Ann Emerg Med 2006; 48: 570–582.
2. Cairns C, Kang K and Santo L. National hospital ambulatory medical care survey: 2018 emergency department summary tables. https://www.cdc.gov/nchs/data/nhamcs/web_tables/2018-ed-web-tables-508.pdf
3. Çikrıkçı Işık G, Tandoğan M, Şafak T, et al. Retrospective analyses of the frequent emergency department users. Eurasian J Emerg Med 2020; 19: 89–93.
4. Özdaoğlu A, Yalçınkaya O and Özdaoğlu G. Ege bölgesi’ndeki bir araştırma ve uygulama hastanesinin acil hasta verilerinin simülé edilerek analizi. Istanbul Ticaret Üniv Fen Bilim Derg 2009; 8: 55–68.
5. Sert PÇ, Durak VA, Özdemir F, et al. Acil servise başvuran hasta özelliklerine göre uygun acil servis tasarrfunun belirlenmesi. Uludağ Üniv Tip Fak Derg 2017; 43: 17–21.
6. Yüksel A. Erişkin acil servise başvuran hasta profilisi, tam kodları ile triaj yönünden değerlendirilmesi. Anatol J Emerg Med 2020; 3: 37–41.
7. TC Sağlık Bakanlığı Kamu Hastaneleri Genel Müdürlüğü. “Her branşta ilk 100 hastane” 2017 yıl oca ekim dönemi poliklinik, yatış, yoğun bakım ve acil servis istatistikleri. Ankara, Turkey: TC Sağlık Bakanlığı Kamu Hastaneleri Genel Müdürlüğü, 2018.
8. Çocuk Acil Tip ve Yoğun Bakım Derneği. Türkiye’de ve dünyada çocuk acil tip hizmetleri mevcut durum ve öneriler. Istanbul, Turkey: Çocuk Acil Tip ve Yoğun bakım Derneği, 2008.
9. Shah MN, Cushman JT, Davis CO, et al. The epidemiology of emergency medical services use by children: an analysis of the National Hospital Ambulatory Medical Care Survey. Prehosp Emerg Care 2008; 12(3): 269–276.
10. Phelps K, Taylor C, Kimmel S, et al. Factors associated with emergency department utilization for nonurgent pediatric problems. Arch Fam Med 2000; 9(10): 1086–1092.
11. Feigelman S, Duggan AK, Bazell CM, et al. Correlates of emergency room utilization in the first year of life. Clin Pediatr 1990; 29(12): 698–705.
12. Fosarelli PD, DeAngelis C and Mellits ED. Health services use by children enrolled in a hospital-based primary care clinic: a longitudinal perspective. Pediatrics 1987; 79(2): 196–202.
13. Christakis DA, Wright JA, Koepsell TD, et al. Is greater continuity of care associated with less emergency department utilization. Pediatrics 1999; 103(4 Pt. 1): 738–742.
14. Sarver JH, Cydulka RK and Baker DW. Usual source of care and nonurgent emergency department use. Acad Emerg Med 2002; 9(9): 916–923.
15. Berry A, Brousseau D, Brotanek JM, et al. Why do parents bring children to the emergency department for nonurgent conditions? A qualitative study. Ambul Pediatr 2008; 8(6): 360–367.
16. Burt CW and Middleton KR. Factors associated with ability to treat pediatric emergencies in US hospitals. Pediatr Emerg Care 2007; 23(10): 681–689.
17. Çınar O, Acar YA, Çevik E, et al. Acil Servise başvuran 0-18 yaş grubu adli olguların özellikleri. Anatol J Clin Investig 2010; 4: 148–151.
18. Pakdemirli A, Orbatur D and Berksoy E. Evaluation of the patients admitted to the pediatric emergency service: Cross-sectional analysis of the pediatric emergency and trauma clinic of a tertiary training hospital in Turkey. Ulus Travma Acil Cerrahi Derg 2020; 26(2): 296–300.
19. Anıl M, Anıl AB, Köse E, et al. The evaluation of the patients admitted to the pediatric emergency department in a training and research hospital. *J Pediatr Emerg Care* 2014; 1: 65–71.

20. Temizkan RC, Büyük N, Kiliçaslan Ö, et al. Bir tıp fakültesi hastanesinin çocuk acil servisine başvuran hastaların özel-liklerini. *Anatol Clinic J Med Sci* 2019; 24: 122–131.

21. El-Masri M, Bornais J, Omar A, et al. Predictors of nonurgent emergency visits at a midsize community-based hospital system: secondary analysis of administrative health care data. *J Emerg Nurs* 2020; 46(4): 478–487.

22. Andrews H and Kass L. Non-urgent use of emergency departments: Populations most likely to overestimate illness severity. *Intern Emerg Med* 2018; 13(6): 893–900.

23. Tsai JC, Liang YW and Pearson WS. Utilization of emergency department in patients with non-urgent medical problems: patient preference and emergency department convenience. *J Formos Med Assoc* 2010; 109(7): 533–542.

24. Idil H, Kilic TY, Toker I, et al. Non-urgent adult patients in the emergency department: Causes and patient characteristics. *Turk J Emerg Med* 2018; 18(2): 71–74.

25. Uscher-Pines L, Pines J, Kellermann A, et al. Emergency department visits for nonurgent conditions: systematic literature review. *Am J Manag Care* 2013; 19(1): 47–59.

26. Erimşah ME, Yaka E, Yilmaz S, et al. Inter-rater reliability and validity of the Ministry of Health of Turkey’s mandatory emergency triage instrument. *Emerg Med Australas* 2015; 27: 210–215.

27. Dunn OJ. Multiple comparisons among means. *J Am Stat Assoc* 1961; 56: 52–64.

28. Polat O, Kabaçam G, Güler İ, et al. İbn-i sina hastanesi acil servis’ine başvuran hastaların surveyans analizi. *Türk Acil Tip Dergisi* 2005; 5: 78–81.

29. Çevik C and Tekir Ö. Acil servis başvurularının tanı kodları, triyaj ve sosyodemografik açıdan değerlendirilmesi. *Balıkesir Sağlık Bilimleri Dergisi* 2014; 3: 102–107.

30. Aydın T, Aydın AŞ, Köksal Ö, et al. Uludağ üniversitesi tıp fakültesi hastanesi acil servisine başvuran hastaların özel-liklerinin ve acil servis çalışmalarının değerlendirilmesi. *Akad Acil Tip Dergisi* 2010; 9: 163–168.

31. McCaig LF and Nawar EW. *National hospital ambulatory medical care survey: 2004 emergency department summary*. Scotts Valley, CA: Createspace Independent Pub, 2013.

32. Ayvaz A, Gungor N, Topbas M, et al. Characteristic of the child patients admitted to emergency department in Surnene Government Hospital, Trabzon. *Cumhuriyet Üniv Tip Fakultesi Dergisi* 2007; 29: 156–162.

33. Polat S, Özayazicioğlu N, Tufekci F, et al. Çocuk acile başvuran 0–18 yaş grubu oğuların incelenmesi. *Atatürk Üniv Hemşire Yüksekokulu Dergisi* 2005; 8: 55–62.

34. Karakas N, Özdemir B, Kılıç Ş, et al. Ebeveynleri çocuk acile getiren nedenler: 4 yıllık İzlem. *Osman Tip Derg* 2020; 42: 67–74.

35. McDermott KW, Stocks C and Freeman WJ. Overview of pediatric emergency department visits, 2015. In: *Healthcare cost and utilization project (HCUP) statistical briefs* [Internet]. Rockville, MD: Agency for Healthcare Research and Quality, 2018.

36. Cag Y, Ozçetin M, Özdemir AA, et al. Evaluation of using pediatric emergency rooms. *North Clin Istanb* 2019; 6(2): 134–140.