

Evaluation of Child Emergency Department Utilization: Differences Between Refugee and Resident Children.

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Abstract

Objectives: Evaluation of emergency department (ED) utilization by Syrian refugee children will provide important information about their health care needs and utilization as a prerequisite for improving preventive health services and outcomes. We aimed to compare ED utilization of refugee and resident children in a tertiary university hospital in Istanbul, Turkey.

Methods: Electronic medical records of Syrian refugee children ≤ 18 years old presenting to the ED between January 2013 and July 2019 were retrospectively reviewed and compared with the resident children.

Results: The study population consisted of 7299 refugee and 690127 resident children admitted to the ED. Emergent cases were more frequent in Syrian refugees (2.2% vs 1.0% $p < 0.001$). One third of Syrian children were under 12 months of age (31.0% vs 17.4%, $p < 0.001$). Syrian children were more commonly hospitalized (7.9% vs 3.1% $p < 0.001$). Rate of intensive care unit hospitalization (13.4% vs 9.4%, $p = 0.001$) and neonatal hospitalization was higher in Syrians compared to resident children (29.3% vs 12.0%, $p < 0.001$). Respiratory and gastrointestinal diseases were the most frequent diagnoses which were similar in both groups.

Conclusion: Refugee children as compared to native children are more likely to present to the ED with high acuity conditions, at a younger age resulting in higher rates of inpatient admissions. Strategies to increase access to preventive health care services for young refugee children should be explored to decrease ED and hospital services and improve health outcomes.

What Is Known?

- Children are the most affected victims of armed conflicts in terms of health outcomes.
- Refugees prefer to access healthcare through emergency department.

What Is New?

- Younger refugee children were at greater risk for ED presentation compared to the resident children.
- Refugee children were more likely to present as urgent when compared to resident children.
- Admission to the neonatal inpatient services and intensive care units was more frequent among refugee children.

Introduction

The Syrian conflict resulted in the largest displacement crisis in history with more than 7.2 million Syrians seeking asylum in other countries (1). Turkey first opened camps for refugees in 2011 and remains the country hosting the largest Syrian refugee population (2). As of June 2019, there are 3.6 million registered

Syrian refugees in Turkey under “Temporary Protection” (3). “The Temporary Protection Regulation” in Turkey, which applies to only Syrian refugees, promotes their access to national systems, such as health care, education, and social protection free of charge in the city where they are registered.

Medical conditions and health care needs of refugees differ from the needs of resident population (4). Children are the most vulnerable victims of armed conflicts. Displacement, separation from family members, lack of education, and access to health services increase their vulnerability (5). Among Syrian refugees residing in Turkey, children constitute 1.6 million individuals under age 18. In June 2019, Abdullah Ayaz, Ministry of Interior Director General of Migration Management, announced that since 2011 more than 415,000 Syrian babies were born in Turkey (6). This has created a considerable burden on the paediatric and maternal health services in the country.

Health risks and needs of refugee children are increasingly investigated but studies about ED utilization involving paediatric refugee populations are still limited (7-11). As the number of Syrian refugees fleeing to Turkey increases, emergency services utilization in government hospitals is also increasing (12). Evaluation of emergency department (ED) utilization by Syrian refugee children will provide important information about their health care needs and utilization as a prerequisite for improving preventive health services and outcomes.

Material And Methods

Study Design and Setting

In this retrospective investigation, all paediatric ED encounters ≤ 18 years old between January 2013 and July 2019 at the Marmara University Teaching and Research Hospital, in Istanbul were reviewed to gather information about the utilization of ED services by Syrian refugee children. Istanbul is the largest city in Turkey with approximately 15 million inhabitants. As of June 2019, 548,865 registered Syrians reside in Istanbul under temporary protection, which is 3.64% of the total resident population (3). Even though the status of “temporary protection” in Turkey is different from the legal status of “refugees”, all Syrian children under temporary protection were considered as refugees in this study (13). These included Syrian children born in Syria, in Turkey and in other countries and residing in Turkey under temporary protection. The hospital is the only governmental university hospital in the Asian side of Istanbul and is in Pendik where 0.72% of the population are Syrian refugees but also very close to another city district, Sultanbeyli, where Syrian refugees compose 6.27% of the population (14). Registered Syrian refugees can access hospital services without cost. For unregistered refugees, only emergency encounters for life threatening conditions are covered by the government. Since there is not a well-functioning patient referral system among the different levels of Turkish healthcare system, referral from primary physicians is not mandatory for access to the hospitals, and both Turkish and Syrian patients can access the ED whenever they need for either urgent or nonurgent reasons. The study protocol was approved by the Marmara University institutional review board (09.2019.616).

Patient Population And Data Collection

Information from ED encounters of all children ≤ 18 years old were obtained from the hospital medical record system. Data regarding age, gender, date of ED visits, triage category, diagnosis and inpatient hospital admissions status were collected. Emergency Severity Index version 4 is being used in the paediatric emergency department as the triage category system (15). The Index has five levels. For this study, patients requiring immediate life-saving interventions (Level 1) and those presenting with high-risk conditions (Level 2) were considered as red; patients who are expected to require two or more resources (Level 3) were considered as yellow, and those who are expected to require one resource (Level 4) or no resources (Level 5) are considered as green (15). Resources included laboratory tests, X-ray, injections, procedures, and consultations. Triage code category was determined on presentation to the ED by a nurse according to the institutional criteria defined above considering the presenting complaints and vital signs of the patients. Diagnoses were classified according to the International Classification of Diseases 10 (ICD-10). Patients were categorized into resident patients and Syrian refugee patients for comparison. Resident patients were children with a Turkish ID and did not include other immigrant children. Syrian refugee patients were Syrian children under temporary protection regardless of their country of birth.

Statistical Analysis

Categorical variables were summarized by frequencies (n) and percentages (%) and compared by Chi-square test. Continuous variables were expressed as medians and interquartile range (IQR, 25-75). The hypothesis of normal distribution was tested using Kolmogorov-Smirnov test. Differences of continuous variables between groups were compared by Kruskal Wallis and Mann-Whitney U test where appropriate. Data were analysed using Statistical Program for the Social Sciences (SPSS) version 20.0 (IBM, Armonk, NY, USA). A critical p value of 0.05 was accepted as significant.

Results

Patient Characteristics

Table 1 shows characteristics of both Syrian and resident populations. Syrian patients (2.2%) were significantly more likely to present as emergent (red triage) when compared to resident children (1.0%, $p < 0.001$, odds ratio: 2.30, 95% CI: 1.95-2.64). The proportion of children under 12 months of age presented to the ED was higher among Syrian children compared to the resident population (31.0% vs 17.4%, $p < 0.001$, OR: 2.13, 95% CI: 2.03-2.24).

Table 1
 Characteristics of paediatric patients presenting to the emergency department.

Category	Turkish N=690127 (99.0%)	Syrian N=7299 (1.0%)	P-Value
Male/female, n (%)	372275 (53.9)/ 317852 (46.1)	4036 (55.3) /3263 (44.7)	0.02
Age in months †	54 (20-107)	33 (9-92)	<0.001
Age groups (months), n (%)	119780 (17.4)	2258 (31.0)	<0.001
0-12	147781 (21.4)	1570 (21.5)	
13-36	104196 (15.1)	876 (12.0)	
37-60	174362 (25.3)	1250 (17.1)	
61-120	143956 (20.9)	1340 (18.4)	
≥121			
Triage category, n (%)	442841 (64.2)	4757 (65.2)	<0.001
Green	240464 (34.8)	2378 (32.6)	
Yellow	6822 (1.0)	164 (2.2)	
Red			
Year of outpatient admission, n (%)	97747 (14.2)	18 (0.2)	<0.001
2013	106966 (15.5)	359 (4.9)	
2014	113197 (16.4)	975 (13.4)	
2015	104689 (15.2)	1431 (19.6)	
2016	101230 (14.7)	2109 (28.9)	
2017	108859 (15.8)	2040 (27.9)	
2018	57439 (8.3)	367 (5.0)	
2019 (Until July)			
Season of outpatient admission, n (%)	195399 (28.3)	2173 (29.8)	<0.001
Winter	191264 (27.7)	1794 (24.6)	
Spring	147370 (21.4)	1760 (24.1)	
Summer	156094 (22.6)	1572 (21.5)	
Autumn			

Category	Turkish N=690127 (99.0%)	Syrian N=7299 (1.0%)	P-Value
† Median (interquartile range)			

Inpatient Hospitalization

Overall, 3.2% (n=22069) of ED visits resulted in inpatient hospitalizations. The proportion of hospitalized Syrian children was higher in comparison to Turkish children (n=573, 7.9% vs n=21496, 3.1% $p<0.001$, OR:2.65, 95% CI: 2.43-2.88). Median age of the hospitalized Syrian children was younger than resident children [12 (0-83) months vs 41 (8-111) months, $p<0.001$]. Admitted children were more likely to be a Syrian refugee than a resident in all age groups (Table 2). Almost half (51.0%) of the Syrian admissions were under 12 months of age. Admission to the neonatal inpatient services was more frequent among Syrian children (n=166, 29.0%), compared to resident children (n=2578, 12.0%, $p<0.001$). Similarly, the hospitalizations to all intensive care units (ICU) were significantly higher among Syrian refugees (n=77, 13.4%) than among resident children (n=2013, 9.4%, $p=0.001$). This difference was related to the neonatal intensive care unit (NICU) admissions because among admitted patients, Syrian neonates (n=41, 7.2%) were more likely to be admitted to the NICU than the resident neonates (n=987, 4.6%, $p=0.004$, OR: 1.60, 95% CI:1.15-2.21).

Table 2
Inpatient admissions according to age groups

Age groups (months)	Inpatient admission/ Total emergency service admission		P-value	OR (95% CI)
	Syrian n (%*)	Turkish n (%*)		
0-12	292/2258 (12.9)	6507/119780 (5.4)	<0.001	2.58 (2.28-2.93)
13-36	81/1570 (5.2)	3753/147781 (2.5)	<0.001	2.08 (1.66-2.61)
37-60	39/876 (4.5)	2319/104196 (2.2)	<0.001	2.04 (1.48-2.82)
61-120	49/1250 (3.9)	4065/174362 (2.3)	<0.001	1.70 (1.28-2.27)
>120	111/1340 (8.3)	4839/143956 (3.4)	<0.001	2.59 (2.13-3.16)
Total	572/7299 (7.8)	21483/690127 (3.1)	<0.001	2.64 (2.42-2.88)
* Percentages represent the proportions of admitted Syrian and Turkish children in each age groups. In the total row, percentages are for the total admitted patients in each group.				

Presentation And Admission Diagnosis According To The Icd-10

Most frequent reason for emergency service visits was respiratory diseases in both groups. Emergency arrivals due to respiratory problems were significantly higher among Syrians (n=4869, 66.4% vs

n=433733, 62.9%, $p<0.001$), whereas gastrointestinal problems were more common in native children (n=73077, 10.6% vs n=521, 7.1%, $p<0.001$). (Figure 1) Respiratory and gastrointestinal system problems collectively accounted for approximately three quarters of all ED visits of both Syrian (n=5361, 73.5%) and resident (n=506810, 73.4%, $p=0.85$) children. Most of the visits related to respiratory and gastrointestinal system diseases were non-urgent visits constituting 73.8% of visits categorized as green and yellow, 38.4% were red triaged visits. Respiratory problems (n=8339, 37.8%) were the most common reasons for inpatient admissions, followed by factors influencing health status and contact with health services (Z00-Z99) (n=4259, 19.3%), symptoms, signs and abnormal clinical and laboratory findings (R00-R99) (n=2289, 10.4%) and diseases of the digestive system (n=1597, 7.2%).

Discussion

Our study revealed significant differences between Syrian refugee and Turkish resident children. Although non-emergent ED visits were most frequent in both groups, more refugee patients required immediate or urgent care compared to native-born children. In addition, inpatient treatment, ICU admissions (neonatal and paediatric) and hospitalization of neonates were more frequent in refugee children. Respiratory and gastrointestinal system diseases were the most common reasons for presenting to the ED in both groups –75% of these presentations were non-emergent.

Similar to our results, the study by Baykan et. al. conducted in Nevsehir, Turkey, noted that between 2013 and 2017 the number of ED visits by Syrian refugees increased exponentially (12). The fall after 2018 in our centre may be related to the establishment of another state hospital in 2018 near our hospital, where refugee children may also have presented. Also, living conditions of the refugees might have changed, improving their socioeconomic status leading to better integration to the country's healthcare system. In any case, migration from Syria created a significant overload on Turkey's emergency healthcare system (16-18).

Our findings showed that although non-emergent visits were high in both groups, immediate and urgent patients were significantly greater in refugee children compared to native children. Consistent with our findings, in a study from Italy looking at the utilization of emergency services by migrant children under the age of one was more frequent for both non-urgent and very urgent visits, and ED visits of immigrant children were more likely to be followed up by hospitalization as they presented with more severe and complex conditions (19). Another study from Turkey reported higher utilization of resources among refugee children presenting to the ED due to presentation with more severe disease (20). Higher representation of refugee children with more acute conditions may be related to delayed presentation, caregiver's inability to recognize and accurately judge serious medical conditions, language barriers, or cultural predilection of traditional care-seeking practices (5,9,21-23). Other reports have identified that insurance status may affect the pattern of ED utilization of refugees, with overrepresentation of high acuity conditions due to delayed presentation (24-26). However, this specific reason does not apply to Syrian refugees in Turkey as all health costs are covered by Ministry of Interior Disaster and Emergency Management Presidency according to the Temporary Protection Regulation (27). Further research is

needed to better elucidate factors other than financial issues that are related to the frequent use ED visits among refugee children in Turkey.

This study also identified a greater number of infant ED visits among Syrian children as compared to native children. This has also been identified in a previous study (19). Consistent with other studies, our research found an increased frequency of hospitalization among refugee children compared to the resident children (12,20). Increased hospitalization was particularly observed among refugee neonates. This is in line with another study showing that infants born from immigrant women were more likely to be admitted into neonatal intensive care unit when compared to the native-born infants born in Canada (28). We did not investigate the reasons for the higher proportion of Syrian infant ED visits and neonatal inpatient admissions, but it may be possible these children have not acquired primary preventive care or general healthcare services that would protect them to some extent from more serious conditions requiring hospitalization (29). Policies and education to increase primary health care seeking practices of refugee families are necessary to expand preventive health care approaches and improve the health of neonates and infants.

Rates of intensive care unit hospitalizations were observed to be higher in refugee children, particularly related to NICU hospitalizations. This again emphasizes the need for preventive services focused on neonates. Labelling all refugee births as high-risk and providing them with frequent appointments in the well-child clinic can help in detecting medical issues earlier, thus improving their health status and decreasing their ED usage. Over representation of immigrant children in paediatric intensive care unit is common among other immigrant communities as well. (30). Factors, including language or cultural barriers, and financial difficulties while accessing health care such as cost of transportation should be further explored. Efforts to overcome these factors would improve access to preventative services.

Similar to other studies globally, the most common reasons for admissions to the ED were respiratory diseases and gastrointestinal system disorders in both refugee and resident children (31,32). When the neonatal period is excluded, acute respiratory infections and diarrheal diseases remain the leading cause of death among children under 5 years of age (33,34). As these are preventable and treatable causes of death, it is important to increase preventive and curative interventions targeting this most vulnerable age to reduce child mortality, such as vaccination, improved nutrition, sanitation, hygiene and altered health care seeking behaviour. Similarly, increasing preventive measures for communicable diseases will also help to reduce the burden on ED services as these were the most common reasons for ED arrivals in our study. Alternatively, appropriate management of minor illnesses related to respiratory and gastrointestinal system diseases in the primary care settings will reduce overcrowding in our hospital ED.

Our study, with the largest sample size to the best of our knowledge, adds to the limited information about ED utilization of refugee children. Choosing a control group allowed us to conduct a comparative study across refugee and local groups of children in a single tertiary hospital setting across time. The use of registered data and large sample sizes strengthened our study. However, our study has several limitations. The study is cross-sectional in design and from a single facility, limiting its generalizability to

all refugee children. In addition, we did not evaluate the effects of the components of the socioeconomic status (SES), such as parental educational level and income, on ED utilization, since hospital medical record system was lacking this data. Maternal education level has been shown to be inversely related with higher ED utilization rate (21). However, given the location of our hospital and considering that the hospital is a state hospital, we presume that most of the Syrian and Turkish patients originate from middle and low SES. Another limitation is that the clinical information available in this study is limited to the ED visit records which may provide mis-entered data especially regarding ICD-10 diagnoses. Finally, our analysis does not include information regarding how long Syrian refugees were living in Turkey when they presented to the ED. This may have effects on patterns of ED utilization, since length of stay in the newly settled country may impact parents' language, and the level of information they know about the services offered.

In conclusion, our findings show the significant impact of paediatric Syrian refugee child admissions to the paediatric emergency health care services at tertiary level. These ED admissions were primarily for respiratory and gastrointestinal infections. ED services might be reduced by improving access to primary preventive health care services that specifically focus on Syrian refugee children under five years of age. Despite governmental efforts to ensure equal health services for Syrian refugees in Turkey, the health care needs of refugee children may remain unmet as we showed in differences in utilization of ED services. Reasons for higher ED utilization of younger Syrian children, presentation with more acute conditions and higher hospitalization rates compared to the resident children should be further investigated to develop new health policies and approaches to refugees' unmet health needs. Knowledge of and access to primary health care should be improved to improve health outcomes and decrease the burden on hospital emergency units. The findings of our study should be used to guide policy decision-making and hospital funding. Health policy strategies to promote health of refugee children should be developed and implemented by intersectoral coordination, including governments, civil protection authorities, paediatric societies, families, and children.

Abbreviations

- ED: Emergency department
- ICD-10: International Classification of Diseases 10
- ICU: Intensive care unit
- IQR: Interquartile range
- NICU: Neonatal intensive care unit
- SES: Socioeconomic Status

Declarations

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Availability of data and material: Not applicable

Code availability: Not applicable

Authors' contributions: All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by Ezgi Baris, Nicel Yildiz Silahli, Nuriye Ayca Gul and Lubna Qutranji. The first draft of the manuscript was written by Ezgi Baris, and all authors commented on previous versions of the manuscript. Critical revision for important intellectual content was performed by Perran Boran and Jeffrey Goldhagen. All authors read and approved the final manuscript.

Ethics approval: The study protocol was approved by the institutional review board of the Marmara University School of Medicine (09.2019.616).

Consent to participate: Not applicable

Consent for publication: Not applicable

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Figures

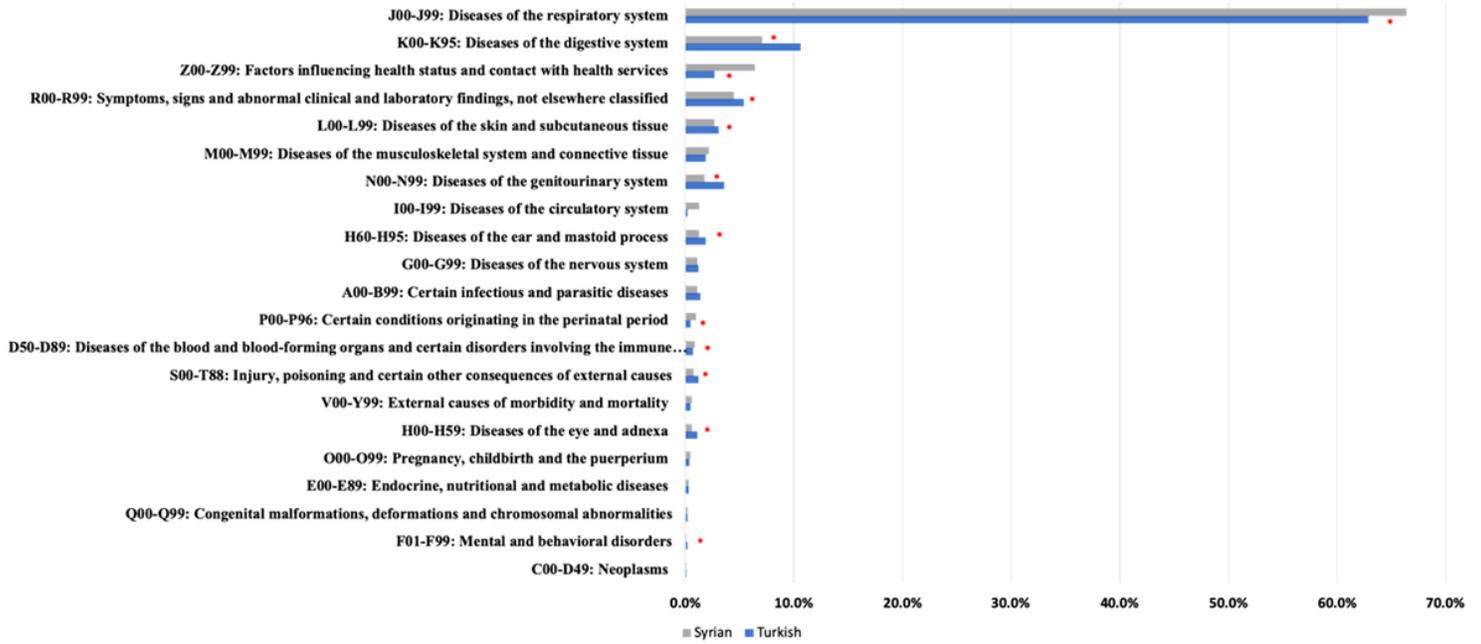


Figure 1

Bar chart showing the diagnoses among refugee and native children presenting to the emergency department