Emergency department visits of Syrian refugees and the cost of their healthcare

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ABSTRACT

The aim of this study was to evaluate the demographic and clinical characteristics of Emergency Department (ED) visits made by Syrian refugees and to assess the cost of their healthcare. This retrospective study was conducted in adult Syrians who visited the ED of Adiyaman University Training and Research Hospital, Adiyaman Province, Turkey, between 01 January and 31 December 2015. We evaluated 10,529 Syrian refugees who visited the ED, of whom 9,842 were included in the study. The number of ED visits significantly increased in 2015 compared with 2010; the increase in the proportion of total ED visits was 8% ($n = 11,275$, dif: 8%, CI 95%: 7.9–8.2, $p < 0.001$). Of this 8%, 6.5% were visits made by Syria refugees and the remaining 1.5% accounted for the visits made by other individuals. Upper respiratory tract infections (URTI) were the diseases most frequently presented ($n = 4,656$; 47.3%), and 68.5% of ED visits were inappropriate ($n = 6,749$). The median ED length of stay (LOS) of the Syrian refugees was significantly longer than that of the other individuals visiting the ED ($p < 0.001$). The total cost of the healthcare of the Syrian refugees who visited the ED was calculated as US\$ 773,374.63. This study showed that Syrian refugees have increased the proportion of ED visits and the financial healthcare burden. The majority of ED visits made by Syrian refugees were inappropriate. In addition, their ED LOS was longer than that of other individuals making ED visits.

KEYWORDS

Syrian refugees; cost; adult patients; health care; length of stay; Adiyaman; Turkey; emergency departments

Introduction

Wars and conflicts are among the preventable causes of human diseases, in addition to causing disability. Since the beginning of the Syrian conflict in March 2011, more than 10 million Syrians have been forced to leave their homes and have sought refuge in neighboring countries [1]. In the resulting influx of thousands of Syrian migrants, the entire world, particularly European countries, now faces a huge refugee problem. Emergency medicine plays the key role of being the healthcare safety net, as it is the last resort for those with no primary healthcare and no alternatives. High-quality emergency care must be provided to all patients, irrespective of whether they are refugees, by physicians who are trained in this specialist field [2]. The plight of migrants, and the influence on their health of their circumstances, is of great contemporary concern, and one way to treat people with dignity is to understand and respond to health problems that are the result of their migrant status [3].

Turkey is one of the first choices of Syrian refugees because of its geographic proximity [4]. In Article 14 of the Universal Declaration of Human Rights, it is stated

that 'Everyone has the right to seek and to enjoy in other countries asylum from persecution'. Turkey, which is guided by this declaration, is committed to providing as many healthcare, food, shelter, education, and social activity facilities as possible for the Syrians who have migrated to this country. According to regularly updated data from the Disaster and Emergency Management Agency of the Government of Turkey (AFAD), Turkey is hosting 2,747,946 Syrian refugees, with 272,812 of these individuals residing inside 25 camps in 10 provinces and 2,475,134 residing outside of camps, as of 16 March, 2016. Currently, 24,229 of these refugees are living in Adiyaman Province; 10,085 reside inside a camp located in this region, while 14,144 live outside this camp [4].

Reports and information detailing the burden of healthcare and expenses resulting from the influx of Syrian refugees often consist of predictions and newspaper articles. Moreover, previous studies regarding the burden of emergency healthcare and financial costs that occur due to the migration of Syrian refugees are scarce. The aim of the present study was to evaluate the use of the ED by Syrian refugees, and the ED and total costs of their healthcare.

Materials and methods

Study design and setting

This retrospective, observational study was conducted in adult Syrian refugees who visited the ED of Adiyaman University Training and Research Hospital, Adiyaman Province, southeast Turkey, between 01 January and 31 December 2015. The pediatric ED, in which children are examined, is in a different location in the province.

The Syrian refugees' camp is close to this hospital, and refugee patients are transported from this camp to the hospital for advanced diagnosis and treatment by the emergency medical service. There are also some Syrian refugees in Adiyaman Province who live via their own resources outside the camp, and visit the hospital ED as out patients. In this hospital, five interpreters serve the Syrian refugees by helping them to communicate with the emergency physician, nurse, and other healthcare professionals. All Syrian refugees' healthcare payments are paid to the hospital by the Government health insurance system, Social Security Organization, and no fee is requested. This study was conducted according to the principles of the Declaration of Helsinki.

Data collection and procedure

The records of Syrian refugees who visited the ED in 2015 were examined and compared with the records of individuals who visited the ED in 2010, before Syrian refugees began entering Turkey. The data were collected from the hospital medical records and the hospital expense billing service. Demographic characteristics of the Syrian refugees who visited the ED, such as age, gender, attendance year, presenting complaint, main diagnosis in the ED, admission to hospital, ED treatment and discharge, ED length of stay (LOS), death (if applicable), and cost were recorded on a data collection form. Adult Syrian refugees (≥ 18 years) who visited the ED were included in the study, and patients with data missing from their hospital medical record were excluded.

Definitions

Non-urgent injuries or diseases were defined as those that did not require urgent investigation or treatment, or require the patient to remain in hospital for further observation [5]. Inappropriate use of the ED was classified as non-urgent injuries or diseases that could be treated elsewhere, as defined by Coleman et al. [6].

The ED LOS was defined as ED discharge (hour and minutes when the patient left the ED) minus ED arrival (hour and minutes when the patient first arrived) and is presented as minutes.

The cost consisted of fees that were paid to hospital by the government health insurance system for Syrian refugees' expenditures. All the cost calculations were

performed by an accounting expert who was blinded to the purpose of this study. In Turkey, the intrinsic system for costs in economic calculation is that of diagnosis-related groups; the costs were calculated at the same rates for refugees.

The total cost consisted of 'medication cost', including drug and bed fees, and 'diagnostic cost', including laboratory and radiological investigation fees. With regard to the currency exchange for cost, 1 US \$ was fixed as 2.877 Turkish Lira (TL).

The Syrian refugee patients were categorized according to four age groups: 18–39 years, 40–59 years, 60–79 years, and 80 years and older. In order to identify the presenting disease or complaint, International Classification of Diseases code 10 was used.

A check list for observational studies from The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement was verified. This study was recorded on clinicaltrials.gov (ID: NCT02721927).

Statistical analysis

Data are presented as mean $\pm$ standard deviation (SD) or median (IQR), where applicable. The Kolmogorov–Smirnov test was used to determine normality, and the Levene test was used to assess the variance homogeneity. The differences in means between groups were compared with the Student's *t* test, and the Mann–Whitney *U* test was used to compare the medians. Categorical data were analyzed by Pearson's χ^2 test. All of the hypotheses were constructed as two-tailed, and a 95% confidence interval (CI) was used for expressing the study data. The study data were analyzed by MedCalc v 12.7.0.0 (MedCalc Software bvba, Ostend, Belgium), Statistical Package for the Social Sciences, version 17.0 (SPSS Inc., Chicago, IL), and Confidence Interval Analysis software. Values of $p < 0.05$ were considered statistically significant.

Results

We evaluated 10,529 Syrian refugees who visited the ED. Of these, 9842 (mean age, 34.6 ± 15.2 years) were included; 687 (6.5%) were excluded from study in accordance with the exclusion criteria.

Total population demographic

In 2010, the total population of Adiyaman Province was 590,935, and this had risen to 602,774 in 2015. The population growth rate was 1.9%.

Total ED visits

In 2010, 140,513 adults visited the ED. This number rose to 151,788 in 2015, 9842 of whom were Syrian patients (Figure 1).

Figure 1. The change between emergency visits and total population by year.

The increase in the proportion of total ED visits was 8%. Of this 8%, 6.5% were visits made by Syria refugees and the remaining 1.5% accounted for the visits made by other individuals. The number of ED visits in 2015 was significantly increased compared with 2010 ($n = 11,275$, dif: 8%, CI 95%: 7.9–8.2, $p < 0.001$).

Demographic and clinical characteristics of Syrian refugee patients

Of 9842 Syrian refugee patients, 4409 (44.8%) were male (mean age, 44.9 ± 3.6 years), and 5433 (55.2%) were female (mean age, 21.9 ± 13.1 years). There was no difference between genders in terms of age (mean dif.: -23 , CI 95%: -23.7 – 22.4 , $p = 0.000$). The demographic and clinical characteristics of the Syrian patients by age group are shown in Table 1.

Most of the Syrian refugees who visited the ED ($n = 6319$, 64.6%) were living outside the camp. Of the total of 9842, 1216 (12.4%) were admitted to hospital, 8594 (87.3%) were discharged, 21 (0.2%) were transferred to another province hospital, 10 (0.1%) died after presenting at the ED, and 1 (0.01%) died on presentation at the ED. None of the patients who visited the ED were injured/wounded civil war victims.

The five most frequently seen diseases or/and complaints accounted for 87.5% of visits (8615/9842). The prevalence of upper respiratory tract infection (URTI) was the highest among all diseases ($n = 4656$, 47.3%, 95%CI: 46.3–48.3), followed by myalgia ($n = 1999$,

20.3%, 95% CI: 19.5–21.1), abdominal and pelvic pain ($n = 1169$, 11.9% 95% CI: 11.3–12.9) urinary tract infection ($n = 489$, 5%, 95% CI: 4.6–5.4), and chest pain ($n = 302$, 3.1%, 95% CI: 2.7–3.4). In all age groups, UTRI was the most common reason for ED visits ($p < 0.05$, for all). The distribution of the five most frequently seen diseases and complaints according to age group is shown in Table 2. A total of 6749 (68.5%) ED visits were inappropriate (defined as non-urgent diseases or injuries that could be treated elsewhere).

The median ED LOS was significantly longer for the Syrian refugee patients than for other individuals who visited the ED during the same period 512.5 min [IQR:525–556, 95%CI:511–514] vs 357 min [IQR:345–372, 95%CI:356–358], respectively ($p < 0.001$).

Cost analysis

The median cost per Syrian refugee discharged from the ED was estimated at US \$19.3 (55.45 TL), ranging from US \$5.7–\$446.15 (16.50–1284.93 TL). Of this cost, US \$3 were for drugs and bed fees (medication cost), while US \$16.3 were for laboratory and radiological investigation fees (diagnostic cost).

The median cost per Syrian refugee patient admitted to clinics was estimated at US \$509.3, ranging from US\$7.3–\$47,133.55 (20.80–135,744.62 TL). Of this cost, US \$400.2 were for the drugs and bed fees (medication cost) and US \$109.1 were for laboratory and radiological investigation fees (diagnostic cost).

The total healthcare cost for Syrian patients was calculated as US \$773,374.63 (2,224,998.82 TL). These total costs consisted of US \$153,405 (441,348.03 TL) for Syrian patients discharged from the ED and US \$619,969 (1,783,650.79 TL) for Syrian patients hospitalized after ED presentation.

Discussion

To our knowledge, this is the first clinical study to describe the epidemiology of ED use by Syrian refugees without war injuries, and to assess their healthcare costs. The outcomes of the present study suggest that, following the migration of Syrian refugees, the rate of ED use

Table 1. The percentage of disposition decisions and gender by age group.

	Total N	Age groups			
		18–39 years (N = 6053, 61.5%)	40–59 years (N = 2795, 28.4%)	60–79 years (N = 738, 7.5%)	≥80 years (N = 256, 0.9%)
Male, n (%)	4409	2440 (55.3)	1524 (34.6)	391 (8.9)	58 (1.3)
Female, n (%)	5433	3614 (66.5)	1271 (23.4)	347 (6.4)	30 (0.6)
Death percentages on presentation to ED, n (%)	1	–	–	–	1 (100)
Death percentages on after presenting to ED, n (%)	10	–	3 (30)	6 (60)	1 (10)
Inappropriate ED use, n (%)	6749	4560 (67.6)	2010 (29.8)	123 (1.8)	56 (0.8)
Admission percentages to hospital, n (%)	1216	346 (28.5)	356 (29.3)	433 (35.6)	81 (6.7)

Note: ED: emergency department.

Table 2. The distribution of the five most frequently observed diseases and complaints in the emergency department by age group of Syrian refugee patients.

Prevalence by age group	Complaint/disease									
	URTI		Myalgia		Abdominal and pelvic pain		UTI		Chest pain	
	N	% CI%95	N	% CI%95	N	% CI%95	N	% CI%95	N	% CI%95
Total	6053		3229		631		205		9	
18–39 years	2795	53.3 (52.1–54.6)	1229	20.3 (19.3–21.3)	631	10.4 (9.7–11.2)	205	3.4 (3–3.9)	9	0.2 (0.08–0.3)
40–59 years	2795	37.4 (35.6–39.2)	621	22.2 (20.7–23.8)	398	14.2 (13–15.6)	203	7.3 (6.4–8.3)	157	5.6 (4.8–6.5)
60–79 years	738	37.8 (34.4–41.4)	121	16.4 (13.9–19.2)	109	14.8 (12.4–17.5)	53	7.2 (5.5–9.3)	102	13.9 (11.5–16.5)
≥80 years	256	40.2 (34.4–46.3)	28	10.9 (7.7–15.4)	31	12.1 (8.7–16.7)	28	10.9 (7.7–15.4)	34	13.3 (9.7–18)

Note: URTI: Upper respiratory tract infection, UTI: urinary tract infection, LRTI: lower respiratory tract infection.

increased by 8%. Of this 8%, 6.5% was due to visits made by Syrian refugees and the remaining 1.5% accounted for the visits made by other individuals.

Earlier studies have shown that young males comprise the greatest proportion of people migrating to other countries [3,7–9]. However, in our study, the majority of Syrian individuals visiting the ED were young female patients with a mean age of 21.9 years. This may be because the healthy young males had to join the war in Syria. Therefore, ill and weak women and children, who obviously lack combat ability or readiness, migrated to other countries.

van Berlaer [10] reported that refugees primarily suffer from respiratory, dental, skin, and digestive diseases. In our study, the five most frequently observed reasons for ED visits were URTI, myalgia, abdominal and pelvic pain, urinary tract infection, and chest pain. URTI was the most common reason for ED visits by Syrian refugees in all age groups, which is consistent with previous studies [11–13]. A possible explanation is that, as many of the refugees are coughing as they huddle in camps, these viruses spread rapidly. This carries a possible burden, as acute respiratory infections are a major cause of morbidity and mortality among displaced people [10].

In our study, myalgia was the second common reason for ED visits. The most common causes of myalgia, or muscle pain (musculoskeletal problems), which is a symptom of many diseases and disorders, are injury, including sprains, infections of the soft tissues, or inflammatory conditions. Musculoskeletal problems without a history of injury are often due to viral infections. Smith et al. [11] reported that musculoskeletal problems were present in almost 20% of the refugees they studied, and were due to a wide variety of causes: accidental trauma was usually the result of falls, not always related to the journey, while acute wounds were either blisters on the feet from walking long distances, or infected wounds caused by barbed wire.

Refugees are at higher risk of psychiatric morbidity, including post-traumatic stress disorder (PTSD). This is the consequence of compulsory migration, the experience of traumatic events, and resettlement in new cultural settings with challenging socio-economic circumstances. Kazour et al. [9] found that the lifetime prevalence of PTSD in Syrian refugees was 35.4%. In our study, mental health complaints or diagnoses did not feature in the top five reasons for visiting the ED. One explanation for this is that patients with mental health complaints are examined in the psychiatry polyclinic in our hospital; they are not brought to the ED, unless they are an emergency case (i.e., have made a suicide attempt).

The majority of Syrian refugees who visited the ED in the present study were living outside the camp. This can be explained by the fact that there is a tent hospital providing primary and first aid healthcare in all camps in Turkey. Therefore, Syrian refugees living inside the camp are often treated in this tent hospital and are

only transferred to our hospital for further diagnosis and treatment. However, Syrian refugees living outside the camp can directly visit the ED whenever they require healthcare. Their treatment is provided by a primary or specialist physician who works in a tent hospital, and indeed they should be treated in the primary healthcare facility in a tent hospital, and its illness-related polyclinics, rather than in the ED.

The definition of a non-urgent ED visit is controversial. A growing body of literature questions the approach of labeling and blaming patients for inappropriate use of health services. We defined non-urgent ED visits by using the definition established by Coleman et al. [6]. A systematic review by Hoot et al. [14] showed that non-urgent ED visits are a common cause of ED crowding and lead to patient mortality, treatment delays, staff shortages, and financial losses. Garcia et al. [15] reported that 10% of ED visits were inappropriate, while Liu et al. [16] claimed that the proportion of inappropriate usage was 54%. A study by Oktay et al. [17] found that 31% of ED visits in Turkey were inappropriate. In the current study, this proportion was rather high (68.5%), but there are several possible explanations for this. A Syrian refugee who seeks healthcare can easily access the ED, and is certain of examination by a physician for diagnosis and treatment. In addition, ED healthcare is completely free of charge for Syrian refugees.

The ED LOS may be influenced by many factors. In the current study, the ED LOS of Syrian refugee patients was longer than that of other individuals presenting at the ED. Wallbrecht et al. [18] found that patients who used interpreters had a significant increase in ED LOS compared with those who did not, so the prolonged ED LOS we observed could be a result of interpreter use by Syrian refugees for assistance in communication with emergency physicians, nurses, and other healthcare staff. In addition, an increased LOS is associated with increased hospital costs; the strategy of reducing the LOS has saved considerably on these costs [19]. Syrian refugees have a higher rate of ED use than non-Syrian individuals, resulting in pressure on the healthcare system via overcrowding of the ED, additional staff workload, or budgetary pressures. While efforts are being made to reduce ED LOS and ED crowding, Syrian refugees have added to the problem. However, it is not the choice of Syrian refugees to visit the ED (with or without inappropriate diagnoses), rather, the established procedures and geographical proximity appears to have this (negative) steering effect.

It has been found that the healthcare costs of refugees from countries experiencing violent conflict are higher than those of refugees from countries where there is no conflict. It is well known that the healthcare costs of refugees from countries in which there is civil war are mostly influenced by the duration in this war [20]. In addition to the financial cost, healthcare providers currently have a large number of patients with whom they have difficulty communicating due to a language barrier, who

have no medical records, and who are socially and psychologically affected [21]. The costs for clinical services for refugees that are borne by the Ministry of Health are greater than in other crises where non-communicable diseases account for a smaller portion of the burden of disease among refugees [22]. The Turkish government reported that expenses for Syrian refugees had reached US\$360 million in January 2013 [23]. In Lebanon, The UN High Commission for Refugees covers 75% of the cost of life-saving, obstetric, and emergency hospital care for refugees. However, refugees are finding it increasingly difficult to scrape together their 25% share of the costs. The agency stated that it had spent US \$40.25 million on subsidizing healthcare costs for 55,000 refugees in Lebanon in 2014, which is approximately US \$727 per person [24].

A study conducted on the hospital cost analysis of orthopedic trauma cases in Syrian war victims reported that the mean treatment cost was 3844 TL (approximately 1336 US\$) [25]. Karakus et al. [26] studied injured and wounded Syrian war victims brought to an ED from Syria and estimated that the average cost per case was approximately US\$1295; in comparison, we found a lower cost per Syrian patient. One explanation for this is that injured patients have a prolonged LOS and are associated with maximum cost, and almost all injured and wounded civil war victims were transferred to Hatay Province hospitals in Turkey, where Karakus et al. [26] conducted their study. As our province is not located near the Syrian border, no injured and wounded Syrian patients were brought to our hospital.

To our knowledge, this study is the first to evaluate total and ED expenditures for the hospital healthcare of Syrian refugee patients. It revealed that an additional financial burden totaling US\$773,374.63 was placed on health expenditures.

Limitations

The present study was conducted in a single center and therefore generalization is, as always, questionable. However, this study may indicate that the cost for Syrian refugee patients was high even for a single center, and, when added to the cost of other centers, the financial burden will likely increase further. As the study data were retrospectively analyzed, other factors affecting the ED LOS, such as co-morbidities, requested medical consultations, details regarding whether the comparisons were adjusted for urgency, severity, type of illness, age, use of interpreter, and departure status between admittance and discharge could not be evaluated, and we could not report the difference in the ED LOS for admitted versus discharged ED patients. In addition, we could not evaluate whether the characteristics of the Syrian refugees who choose to settle in Adiyaman are different from the average Syrian refugees in Turkey. Since the Syrian pediatric refugee patients were examined in Adiyaman

Children's Hospital, which is in a different location from the hospital where our study was conducted, only adult Syrian refugee patients could be enrolled in this study.

Conclusions

The results of the present study suggest that ED use increased as a result of visits from Syrian refugees, and the additional financial burden that was due to the healthcare of Syrian refugee patients was considerable. The most common reason for ED visits in all age groups was URTI. The majority of the ED visits made by Syrian refugee patients were inappropriate, and the ED LOS for these patients was longer than for other ED patients.

Syrian refugees can greatly affect the healthcare system and health expenditures in countries that agree to host them. The present study draws attention to the fact that global collaboration is always required, particularly in cases of global crises, such as wars and conflicts.

Disclosure statement

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