

Pediatric undocumented immigrants require more hospitalizations and longer in-patient stay than the local citizen population

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Abstract

Background: The ongoing global refugee crisis has raised concerns among medical communities worldwide. **Methods:** We compared data from undocumented immigrant children and Israeli citizen children (ICC) admitted to the pediatric department (PD) at Wolfson hospital in Israel, between 2013–2017.

Results: 104,244 visits (0-18 years) to the pediatric emergency department (PED) were recorded. The admission rates to the PD for undocumented immigrant children was 695/2541 (27%) as compared to 11,858/101,703 (11.7%) for Israeli citizen children ($P < 0.001$). After matching for age groups (0-5 years), the hospital stay duration for the 0-2 years age was 3.22 (± 4.80) days for undocumented immigrant children and 2.78 (± 3.17) for the local Israeli citizen population ($P < 0.03$). For 0-2 year old children, re-admission rates within 7 days were 1.3% for undocumented immigrant children and 2.6% for Israeli, ($p < 0.05$). Dermatological diseases (mainly impetigo and cellulitis) were more frequent in undocumented immigrant children (23.30% vs. 13.15%, $p < 0.01$), however, acute gastroenteritis and respiratory diagnoses were more common in Israeli citizen children (11.72% vs. 18.52%, $p < 0.05$ and 6.26% vs. 14.84%, $p < 0.01$, respectively). Neurological diseases (mainly febrile convulsions) were also more frequent in Israeli citizen children (7.7% vs. 3%, $P < 0.05$). Very significantly, 23% of undocumented immigrant children had no health care coverage, while only 0.2% of the Israeli citizen children had no medical coverage ($P < 0.001$).

Conclusion: We found evidence for significant morbidity in undocumented immigrant children as compared to the local Israeli citizen pediatric population, highlighting the need for health policy changes on a national level to provide some sort of health coverage for all children.

Background

Key notes

- The subject of undocumented immigrant children access to health care has been scantily studied so far even though refugees are considered to be a medically high-risk group.
- The results indicated a higher rate of hospitalization and morbidity in undocumented immigrant children.
- These findings highlight the need to tailor a specific approach to treating this population.

With the largest refugee crisis in Europe since the Second World War, and the arrival of masses of displaced persons, including many children, health care systems have been facing new and diverse challenges. As refugee status changes over time, so does their level of accessibility to health services¹.

It is estimated that 52% of the world's 25.4 million refugees are children. In the UK alone, the total number of undocumented child migrants in 2017 was estimated to be over 120,000².

Surprisingly, despite the fact that medical issues concerning this fragile population are discussed in many countries, the subject of refugee and asylum seekers' access to health care, physical and mental outcomes has only been scantily studied, previous researches described higher physical and mental morbidity in refugee children^{3,4,5,6,7}. Fazel et al reported that the life experience of child refugees makes them more vulnerable to mental health problems than children in the host population⁸.

In accordance with global trends at the time, Israel has experienced an influx of refugees and asylum seekers entering its borders of which the overwhelming majority arrived from Eritrea and Sudan that have known ongoing conflicts. By the end of 2016, the Israeli immigration authority registered 40,274 undocumented immigrants residing in Israel, including an estimated 5,500 children⁹. Although formal recognition of refuge status by authorities has proven difficult, all adults and children (regardless of birth country) originating from African countries with known ongoing conflicts are eligible to participate in the Israeli social health care program in a similar fashion to Israeli citizens. The health insurance payment in Israel is income dependent. Israeli health care program offers coverage for both community and hospital medical needs, subsidizing admissions and medicines for a significantly reduced fee for asylum seekers alike Israeli citizens with low income. Furthermore, there are specialized free clinics providing medical service for refugees and asylum seekers who do not partake in the Israeli health care program, among those services are screening for infectious diseases.

Our study was conducted at the "E. Wolfson Medical Center", a hospital located in the city of Holon in central Israel. Most of the refugees and asylum seekers are treated in our hospital due to the geographical proximity to the southern part of the city of Tel-Aviv, where the majority of African undocumented immigrants in Israel reside.

The objective of our study was to compare different characteristics of undocumented immigrant children and local citizen populations including: admission rate from the PED, duration of hospital stay, re-admission rates, medical diagnosis, and health care coverage.

Methods

Data concerning PD admissions from the PED at the E. Wolfson Medical Centre in Holon, Israel, between January 1st 2014 and December 31st 2017 were collected retrospectively using chart review. All undocumented immigrant pediatric patients were assigned with a temporary identification number for non-citizens on PED admission.

Approval by the hospital's Helsinki committee was obtained prior to initiation (Approval number 0098-17-WOMC). Being a retrospective study, there was no need for signed consent and all data gathered remained anonymous.

The two groups compared were defined and divided in the following manner:

A study group composed of pediatric patients (< 18 years of age) who are children of refugees and asylum seekers from African countries. All undocumented immigrant children were assigned with a temporary identification number for non-citizens on PED admission.

A control group comprising pediatric patients (< 18 years of age) who are Israeli citizens.

Matches for age:

1. As only very few undocumented immigrant children (n = 8) in the age range 5-18 years were admitted to the PD, we excluded these children from the statistical analysis. In parallel, we excluded all Israeli citizen children in the same age group (n = 4,278).
2. There were 10.5 times more control children than undocumented immigrant children in the 0-2 year-old group, while in the 2-5 year old group there was a much higher (22 fold) number of control children than undocumented immigrant children. Thus, the mean and median ages between the undocumented immigrant children and Israeli citizen children were significantly different. However the age distribution between the undocumented immigrant children and Israeli citizen children in our separately 0-2 and 2-5 years old groups were comparable (P=0.66, P=0.68 respectively). Considering all the above mentioned facts, comparing both age groups together would have incorrectly interpreted the outcome results.

For the purpose of this study, we considered all pediatric patients originating from Eritrea and Sudan as undocumented immigrant children.

We collected information regarding age, gender, demographics, and medical information relevant to hospitalization: admissions rates from the pediatric emergency department (PED), primary (main) diagnosis (ICD9), re-admissions, prolonged hospital stay, and health care provider.

Exclusion criteria included: hospitalization periods exceeding 90 consecutive days, admissions via referrals from specialist clinics, children with known chronic conditions requiring recurrent admissions (such as HIV, Tuberculosis), and admissions to other pediatric units (Pediatric Intensive Care, Pediatric Surgery, and Pediatric Cardiology).

Outcome measures

The primary outcome of the study was the difference in admission rate of undocumented immigrant children and that of local Israeli citizen children; secondary outcomes were differences in the duration of hospital stay, re-admission rates, medical diagnosis, and health care coverage between the two groups.

Statistical analysis

Data was analyzed with the SPSS 11.0 statistical analysis software (SPSS, Inc., Chicago, IL, USA). Distributions of continuous variables were assessed for normality using the Kolmogorov–Smirnov test (cut off at P = 0.01). Continuous variables with approximately normal distribution were reported as mean ± standard deviation. Continuous variables were compared by using two-tailed independent sample *t*-tests. When variables were highly skewed, comparisons were made using the Mann–Whitney non-

parametric U-test. Categorical variables were compared by using the Chi-square test or by Fisher exact test when appropriate.

Results

During the study period, a total of 104,244 visits (0-18 years) to the pediatric emergency department (PED) were recorded, including 2541 (2.4%) by refugees and 101,703 (97.6%) by Israeli patients, resulting in a total of 12,512 admissions to hospital. Admission rate to the PD among the refugee patients was 695/2541 (27%) as compared to 11,858/101,703 (11.7%) of the Israeli patients ($P < 0.001$). In the 0-5 age group, we identified 687 refugees and 7,580 Israeli children, who were admitted to the PD and were eligible for further evaluation. Admission rates to the PD for ages 0-5 years were 27% in the refugee group as compared to 7.4% in the control group. ($P < 0.001$).

The average length of a single hospital stay in the 0-2 years age group was 3.22 (± 4.80) days in the study group versus 2.78 (± 3.17) days in the control group ($P < 0.003$). In contrast, in the 2-5 years age group, statistical analysis showed a trend without significance 2.55 (± 2.91) and 2.17 (± 2.07) for the study and control groups respectively ($P = 0.08$).

Re-admission rates within 7 days from discharge for the 0-2 year old age group, were 1.3% for the study group as compared to 2.6% for the control group ($p < 0.05$). No significant difference was found when considering the 2-5 year old group.

Dermatological diseases (mainly impetigo and cellulitis) were more frequently diagnosed in undocumented immigrant children as compared to Israeli citizen children (23.30% vs. 13.15%, $p < 0.01$), however acute gastroenteritis and respiratory diagnoses (mainly pneumonia and wheezing) were more common in Israeli citizen children than the undocumented immigrant children (18.52% vs 11.72%, $p < 0.05$ and 14.84% vs 6.26%, $p < 0.01$, respectively). Neurological diseases (mainly febrile convulsions) were also more frequently diagnosed in Israeli citizen children patients than in undocumented immigrant children (7.7% vs. 3%, $P < 0.05$).

Very significantly, 23% of undocumented immigrant children in the study group had no health care coverage, while only 0.2% of the Israeli citizen children had no medical coverage ($P < 0.001$)

Discussion

Our retrospective study identified many significant differences between the undocumented immigrant children and the local Israeli citizen children (admission rates, length of stay, readmissions and health care coverage), highlight the need to tailor a specific approach to this unique and fragile population.

Israel is a committed member of the international treaty for the status of refugees, based on the "convention relating to the status of refugees" of 1951, which states that people who are subject to

persecution based on race, religion, citizenship, political views etc. in their home countries are able to seek refuge in other countries^{9,10}.

The United Nations High Commissioner for Refugees guarantees that in addition to providing shelter, hosting countries must also guarantee basic human rights, including the ability to access basic health services. This guarantee is not dependent on an official recognition of refugee status by the state, in order to promise basic rights while refugee status is processed.

Refugees are generally considered to be a medically high-risk group. In many cases, they were deprived of basic health conditions before their arrival at the host countries, possibly as a consequence of torture, substandard sanitarian conditions, limited access to regular health services, low socio-economic status, and other problems¹⁰.

Refugees and asylum seekers differ from other immigrant populations in their vulnerability and special needs. This is particularly relevant for refugees who may be suffering from HIV/AIDS, tuberculosis, hepatitis, and mental health issues (such as post-traumatic stress disorder and depression)^{10,11}. While the majority of refugees flee from areas with limited health services, reaching a host country, does not necessarily immediately improve their access to health services. Factors contributing to this problem include lack of health insurance, legal status recognition, language barriers, cultural gaps, lack of information, and fear of arrest or deportation^{11,12}. According to Crepeau et al., health care personnel report that refugees often seek medical attention for their children later than would be expected, occasionally arriving in dire conditions that could have been avoidable with early intervention¹³.

The higher rates of hospitalization found in our study group support this claim although an alternative explanation could be a lower threshold to admit refugees due to concerns for lack of follow-up, a primary care provider, access to medications, understanding of health issues,

lack of known medical history, and language and communication difficulties.

In addition, poor living conditions and low economic status can have a direct impact on personal health. These factors result in higher rates of malnutrition, and an inability to purchase medicine¹⁴. Families may live in sub sanitary living conditions with overly crowded homes and parents who are often forced to work for the majority of the day, leaving their children in different facilities for extended periods of time. Overcrowded and poor sanitation living conditions might also explain the high percentage of undocumented immigrant children admitted with integumentary pathologies seen in our study¹⁰.

The higher length of stay of the study group demonstrated in our study can therefore be attributed to a range of variables including language barriers, which cause a delay in discharge due to the reluctance of medical staff to discharge children to parents who do not fully understand further instructions^{11,15}. Another reason for delay may be that medical personal underestimate the capabilities of the parents to manage the care of their children in a community that lacks the finances for good ambulatory medical services.

Regarding readmissions, it is tempting to postulate that the observed difference is a result of the more common use and easier access to medical services by the Israeli citizen children than are enjoyed by the undocumented immigrant children group.

In a study conducted in the United States, immigrants from the far east were found to be less likely to use health care services. The study reported that one of the reasons for this phenomenon resulted from cultural differences with respect to the perception of pain and suffering¹⁶. It is possible that this factor also plays a role in our study population. Nevertheless, we believe that in our populations, the concerning low rate of health-care coverage (77%) in the study group, especially compared to the excellent coverage among the local citizen population (almost 100% coverage) plays a dominant role. This lack of health-care coverage is disadvantageous to the study group, adding to the general financial difficulties of a refugee state, and giving the economic burden of hospitalization further impact on the decision not to seek medical help, due to economic rather than medical considerations.

The Israeli national health insurance law of 1994 mandates that every Israeli citizen has to join one of the four national health insurance organizations and register in order to receive health coverage.

Although the Israeli government has made an agreement with one of the four health insurance organizations to provide undocumented immigrants and their children with insurance for a reduced monthly payment, only 77% of the children in the study group had medical coverage, therefore there was no need to compare different healthcare providers. This may be due to legal issues preventing participation in this program (fear of arrest or deportation due to registration) or lack of financial capabilities. Choosing not to partake in a health insurance program may also be attributed to the existence of alternative solutions that do not necessitate medical coverage. Such options include free clinics for refugees which are supported by the Israeli Medical Association, Ministry of Health, and other various volunteer medical organizations¹². Absence of insurance coverage can potentially delay the seeking of medical attention, thus resulting in a more severe medical presentation that entails a longer duration of hospital stay¹².

Our limitations in this study include being a single center study, limited follow up regarding readmission in other facilities. However being the closest and referral hospital for most of these refugees at central Israel, we believe that our data is still valid in comparison to the local population.

Conclusion

The results of this study reveal disturbing evidence for a significantly higher admission rates and longer overall hospital stay in undocumented immigrant children compared to Israeli citizen children, as demonstrated by higher admission rates and longer overall hospital stays. There were also significant differences in the type of diagnoses between the two populations. Furthermore, as a last point, we noted a disturbing low rate of insurance coverage among refugees.

With the ever-growing global refugee crisis, generating more and more displaced children, these findings should prompt serious and urgent concern. We believe this study is of great importance to all medical communities worldwide. By urging for specific analysis for different refugee population and hosting countries to tailor specific interventions and public health policies that can be rapidly implemented by all branches of the health care system, both in the community and in the hospital setting, in order to assist this vulnerable population.

List Of Abbreviations

Pediatric Emergency Department (PED), Pediatric Department (PD)

Declarations

Ethics approval and consent to participate: The study was approved by the Wolfson Medical Center Helsinki committee and was obtained prior to initiation of research (Approval ID number 0098-17-WOMC). Being a retrospective study, there was no need for signed consent and all data gathered remained anonymous.

Consent for publication: Not applicable.

Availability of data and materials: All data generated and analysed during the current study, such as emergency room and admission ward's data, gathered from Wolfson Medical Center's archives and contain patients private details, therefore are not publicly available. However, there are available from the corresponding author upon reasonable request.

Competing interests: The authors declare that they have no competing interests.

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Authors' contributions: Dr. AO and Dr. MS *collected data, carried out the initial analyses, drafted the initial manuscript, and reviewed and revised the manuscript.*

Dr. AO, Dr. SA, Dr. GM, and Dr. DT *designed the data collection instruments, collected data, carried out the initial analyses, and reviewed and revised the manuscript.*

Ms IB and Mrs. OBO *collected data, carried out the initial analyses.*

Dr AM carried out the initial analysis, was involved in the statistical analysis, and critically reviewed and revised the manuscript.

Prof. ID *conceptualized and designed the study, coordinated and supervised data collection, and critically reviewed the manuscript for important intellectual content.*

All authors have read and approved the manuscript.

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Tables

Table 1. Baseline characteristics between refugee children and local population (0-5 years).

Category	Undocumented Immigrant Children N = 687	Israeli Citizen Children N = 7,580	P-value
Age:			
0-2 years	582	5,557	P < 0.001
old	105	2,023	
2-5 years			P < 0.001
old			
Sex:			
0-2 years			P = 0.4
old:	334	3,039	
Male	248	2,518	P = 0.8
Female			
2-5 years	51	1,088	P = 0.8
old:	54	935	
Male			
Female			

Table 2. Comparison of data between Undocumented Immigrant Children and Israeli citizen children (0-5 years).

Category	Undocumented Immigrant Children N = 687	Israeli Citizen Children N = 7,580	P-value
Length of hospital stay (in days)	3.22 (+-4.8)	2.78 (+-3.17)	P < 0.03
0-2 years old	2.55 (+-2.91)	2.17 (+-2.07)	P = 0.08
2-5 years old			
Re-admissions within 7 days	1.3%	2.6%	P < 0.05
0-2 years old	1.9%	2%	P N.S
2-5 years old			
Common Diagnosis:			
Dermatology	23.30%	3.15%	P < 0.01
Acute Gastroenteritis	11.72%	18.52%	P < 0.05
Respiratory	6.26%	14.84%	P < 0.01
Neurology	3.04%	7.71%	P < 0.05
Health care coverage:	77%	99.8%	P < 0.001

Figures

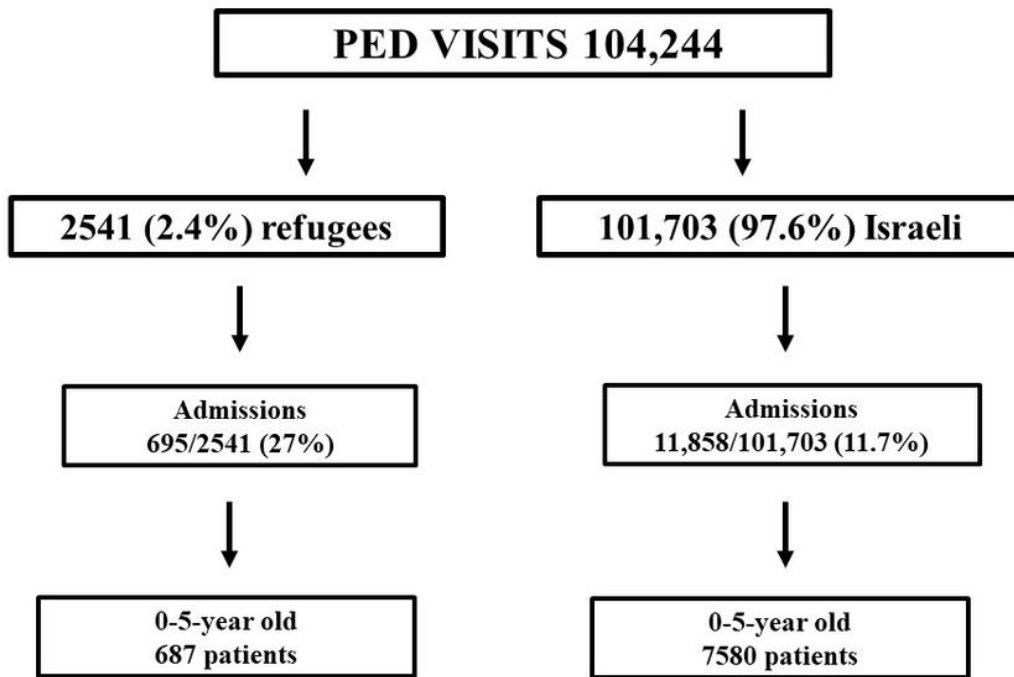


Figure 1

Flow Chart

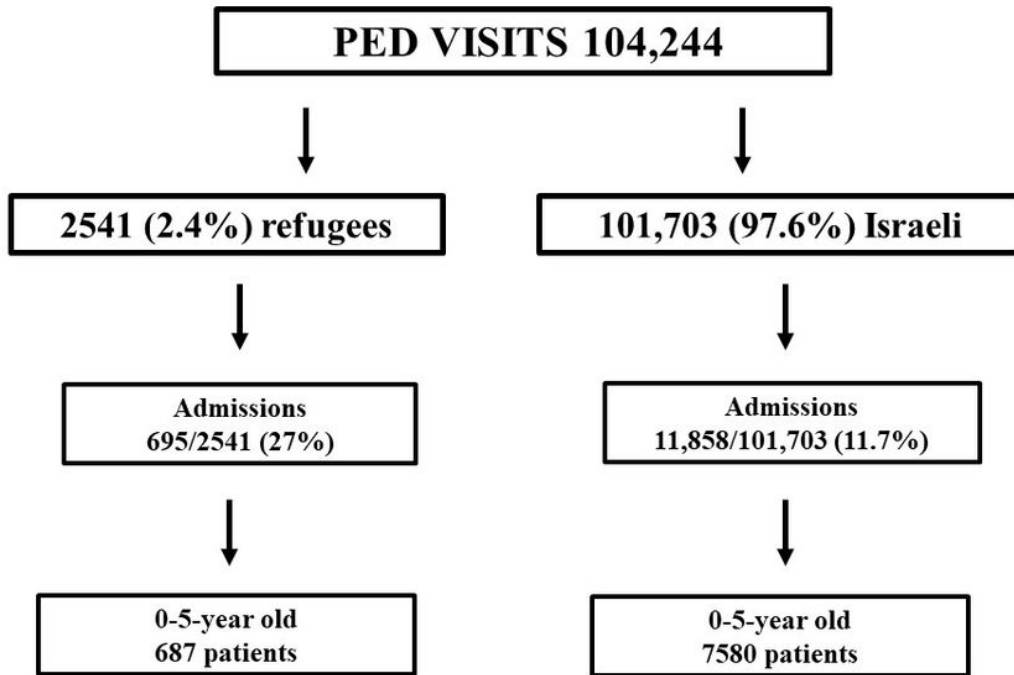


Figure 1

Flow Chart