Research Article / Araştırma Makalesi

Immigrant Child Health Through the Eyes of Orthopedics: Is There a Difference Between Local Children

Ortopedi Gözüyle Göçmen Çocuk Sağlığı: Yerel Çocuklardan Farkı Var mı?

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Abstract

Background: The number of immigrant children admitted to public sector healthcare facilities is increasing. However, comparatively few studies investigated its effects on health systems, especially in the orthopedics discipline. This research investigates if there is a significant difference in admission to orthopedics and traumatology outpatient clinics (O&T) between immigrants and local children.
Materials and Methods: Immigrant (IP) and local patients (LP) under 18 admitted to the O&T of a tertiary hospital between 2019-2021 were included in this retrospective study. Demographic data of patients, number of admission in a year, place of admission, the reason for admission, treatment method, radiological imaging, and diagnoses (soft tissue trauma (STT), developmental hip dysplasia (DDH), etc.) were evaluated for both groups.
Results: 1009 patients were included (n=481 LP, n=528 IP). The number of admissions was higher in IP between 1 and 2 years (p=0.02). The consultations of IP from the emergency department and other departments were statistically higher than those of LP (p<0.001). Fractures/complications and STT are the most common diagnoses in local and immigrant groups. The third most common diagnosis was DDH in LP and general examination in IP. Examinations with MRI and no radiological imaging were more frequent in IP than in LP.
Conclusions: It is noteworthy that the number of admissions to O&T and consultations from other services is higher in IP than the LP. Increasing physicians' awareness of cultural differences and expectations and providing health education to immigrant families through professional translators in their preferred language can diminish the load on healthcare.

Key Words: Children, Health, Immigrant, Orthopedic and traumatology, Refugees

Öz

Amaç: Kamu sektörü sağlık kuruluşlarına başvuran göçmen çocukların sayısı artmaktadır. Bununla birlikte, özellikle ortopedi disiplininde nispeten az sayıda çalışma sağlık sistemleri üzerindeki etkilerini araştırmıştır. Bu araştırma, göçmenler ve yerel çocuklar arasında ortopedi ve travmatoloji polikliniklerine (O&T) kabulde anlamlı bir fark olup olmadığını araştırmaktadır.
Materyal ve Metod: Retrospektif bu çalışmaya, 2019-2021 yılları arasında üçüncü basamak bir hastanenin O&T'sine başvuran 18 yaşın altındaki göçmen ve yerel hastalar dahil edildi. Hastaların demografik verileri, bir yıl içindeki başvuru sayısı, başvuru yeri, başvuru nedeni, tedavi yöntemi, radyolojik görüntüleme ve tanıları (yumuşak doku travması (YDT), gelişimsel kalça displazisi (GKD) vb.) her iki grup için değerlendirildi.
Bulgular: Çalışmaya 481 göçmen ve 528 yerel çocuk olmak üzere 1009 hasta dahil edildi. Başvuru sayısı göçmen çocuklarda 1-2 yaş arasında daha yüksekti (p=0,02). Göçmen çocukların acil servis ve diğer bölümlerden konsültasyonları yerel çocuklardan istatistiksel olarak daha yüksekti (p<0,001). Kırık/komplikasyonlar ve YDT yerel ve göçmen gruplarda en sık görülen tanılardır. Üçüncü en sık tanı yerel çocuklarda GKD ve göçmen çocuklarda genel muayene idi. MRG ve radyolojik görüntüleme istenmeyen incelemeler göçmen çocuklarda daha sıktı.
Sonuç: O&T'ye kabul ve diğer hizmetlerden konsültasyon sayısının göçmen çocuklarda daha yüksek olması dikkat çekicidir. Hekimlerin kültürel farklılıklar ve beklentiler konusundaki farkındalığını artırmak ve göçmen ailelere tercih ettikleri dilde profesyonel tercümanlar aracılığıyla sağlık eğitimi vermek sağlık üzerindeki bu yükü azaltabilir.

Anahtar Kelimeler: Çocuk, Sağlık, Göçmen, Ortopedi ve travmatoloji, Mülteci

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Introduction

Immigration is a global issue all over the world today. International immigrants have increased faster than expected over time, both quantitively and proportionally. Many people become international migrants as asylum seekers or refugees due to global conflicts, education, and employment opportunities (1). It was reported that there were approximately 281 million international migrants and 26.4 million refugees in the world in 2020 (2). The same study presented that 14.6% of the immigrants and 38% of the refugees were under 18 years. Another study reported that there were 2.2 million refugees at the end of 2015 in Turkey, which hosts the largest Syrian refugee population globally, and 7.6 billion USD were spent on expenditures. It was reported that health expenditures had the highest margin of all expenditures for refugees (3).

For the first time, in 1741, the term orthopedics was used by French surgeon Nicholas Andry. It originated from the Greek words “orthos” meaning correct, corrected, and “paydeia” meaning child (4). It should not be forgotten that the basis of orthopedics is the child. Several studies showed that the orthopedics and traumatology department (O&T) is one of the most frequently consulted by pediatric emergency departments (5,6). In addition, 40% of surgical treatment patients in the pediatric emergency department were associated with O&T (7). In China, researchers reported that international immigrants admission to most frequently with orthopedic diseases, otolaryngological diseases in the second, and pediatric diseases related in the thirdly (8). In Turkey, it was reported that 38.2% of the immigrants admitted to orthopedic health services were patients under the age of 18 (9).

To the best of our knowledge, only a few studies analyze the health services in the orthopedics and traumatology department for immigrant and local children (10). This study aimed to examine the differences between immigrant and local children admitted to the orthopedics and traumatology department.

Materials and Methods

This study is retrospective archive research. Patients who were admitted to a single physician (Ö.O.) to the O&T outpatient clinic and consulted between December 2019 and January 2021 in a tertiary hospital on the east side of the country were included. Although the pediatric age limit is 21 years or younger, patients under the age of 18 are considered children in the current health system of the country (11). Thus, only patients under 18 years were included in the study. In this study, immigrant, asylum-seeking, or refugee children were defined as “immigrant children”.

In one year at O&T, the total number of admitted immigrants and local children was 714 and 4115, respectively. Excluding missing data, 528 immigrant children were included in the study. Missing data from 700 local children selected by Statistical Package for the Social Sciences (SPSS) randomization were excluded, and 481 local children were included in the study. As a result, 1009 patients were included in this study. All of the immigrant patients spoke their mother tongue. Therefore, the examination and treatment of immigrant patients were carried out with the help of a hospital translator who spoke the immigrants' mother tongue.

Demographic data of patients (age, gender), number of admissions in a year, place of admission (outpatient clinic, emergency department, other departments), the reason for admission (traumatic, atraumatic), treatment method (conservative, surgical), radiological imaging (X-ray, USG, MRI, CT) and their diagnoses were evaluated for both groups.

According to the pediatric developmental age classification, the ages of the patients were classified into infant (0-12 months), toddler (1-2 years), preschool (3-6 years), school (7-12 years), and adolescent (13-17 years).

Diagnoses were classified as soft tissue trauma (STT), club foot (PEV), developmental dysplasia of the hip (DDH), fracture and its complications, tumor, deformity, general examination, paravertebral spasm, infection, rheumatological pathologies, foreign body, and meniscopathy.

This retrospective chart review study involving human participants was in accordance with the ethical standards of the institutional and national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. The Human Investigation Committee (IRB) of the Harran University approved this study (06/09/2021-HRU/21.15.10).

Statistics

The Statistical Package for the Social Sciences (SPSS Inc., Chicago, IL, USA) v. 21.0 software program was used to construct the databases and perform the statistical analysis. Age distribution data were analyzed using the Shapiro-Wilk test of normality. Age distribution data were given as a median (IQR) and standard deviation (SD) because they did not fit the normal distribution. The Mann-Whitney U test was used to compare the place of admission (outpatient clinic, emergency department, other departments), the reason for admission (traumatic, atraumatic), and the treatment method (conservative, surgical) of the two groups. The number of admissions, radiological imaging, and diagnosis frequencies of both groups in one year were given as a percentage value. In this study, the statistical significance level was accepted as $p<0.05$ with a 95% confidence interval. There were no missing data.

Results

Of the 1009 patients included in the study, 47.67% (n=481) were local children, and 52.33% (n=528) were immigrant children. The mean age of the local children was 6±5.56 (IQR ±SD), while the mean age of the immigrant children was 5±5.45 (IQR ±SD). There was no statistically significant difference in both groups' age, gender, reason for admission, and

treatment method (p=0.29; 0.22; 0.71 and 0.10, respectively).

Demographic data of the patients are presented in Table 1. According to the pediatric development age classification, immigrant children were admitted more frequently in the toddler period (1-2 years old), while local children were admitted more frequently in the school-age period (7-12 years) (p<0.02) as presented in Figure 1. As seen from the same figure, local children did not have any admissions from an emergency or other services in all age categories. In contrast, consultations from these services were statistically higher in immigrant children (n=10 and 40, respectively) (p<0.001).

The frequency of admission in a year, the examinations, and the diagnoses are presented in Table 2. The most frequent admission to the O&T was between one and three times a year (94.45%), as presented in Figure 2. The frequency of children admitted one to three times a year in local children was 93.55% (450/481), while it was 95.63% (503/528) in immigrant children.

Figure 2 also demonstrates utilized the radiological imaging techniques for both groups. X-ray was the most frequently requested examination in local children (35.38%) and immigrant children (38.45%). While the frequency of no radiological imaging (93/528, 9.22%) and utilization of MRI (4/528, 0.40%) was higher in immigrant children. At the same time, the frequency of USG (46/421, 4.56%) was higher in local children than in immigrant children (15/528, 1.49%).

Diagnosis for both groups is illustrated in Figure 3. Fracture and its complications (16.25%), STT (11.50%), and DDH (8.03%) were the most common diagnoses in local children, respectively. In immigrant children, the most common diagnoses were fractures and complications (16.95%), STT (12.49%), and general examination (5.55%), respectively. PEV was higher in immigrant children than in local children (4.16%; 0.59%, respectively), while the DDH was higher in local children than in immigrant children (8.03%; 4.76%, respectively).

According to the health practice communique announced by the country's social security institution, the cost per patient for diagnosis and treatment was calculated. According to this, the One-year conservative treatment of a DDH patient is between 310.56-403.65₺ (min-max). The yearly cost of a PEV patient treated conservatively is between 1034.39-1140.27 ₺ (min-max). The cost of a single examination to the health system is 26.47₺. The cost of diagnosing and treating patients presenting with a foreign body to the healthcare system is 518.01-1826.55₺ (min-max).

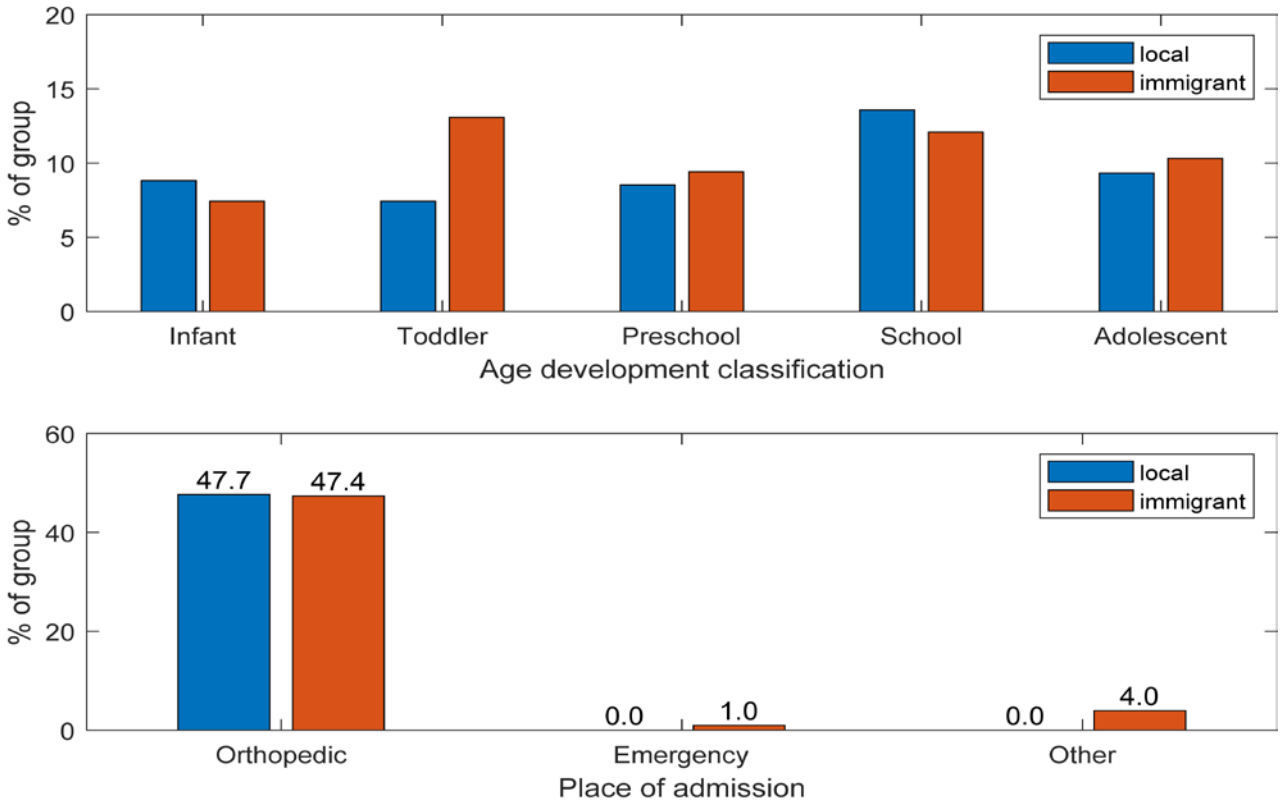

Figure 1. Presentation of the ratio of patients in terms of age development classification and place of admission

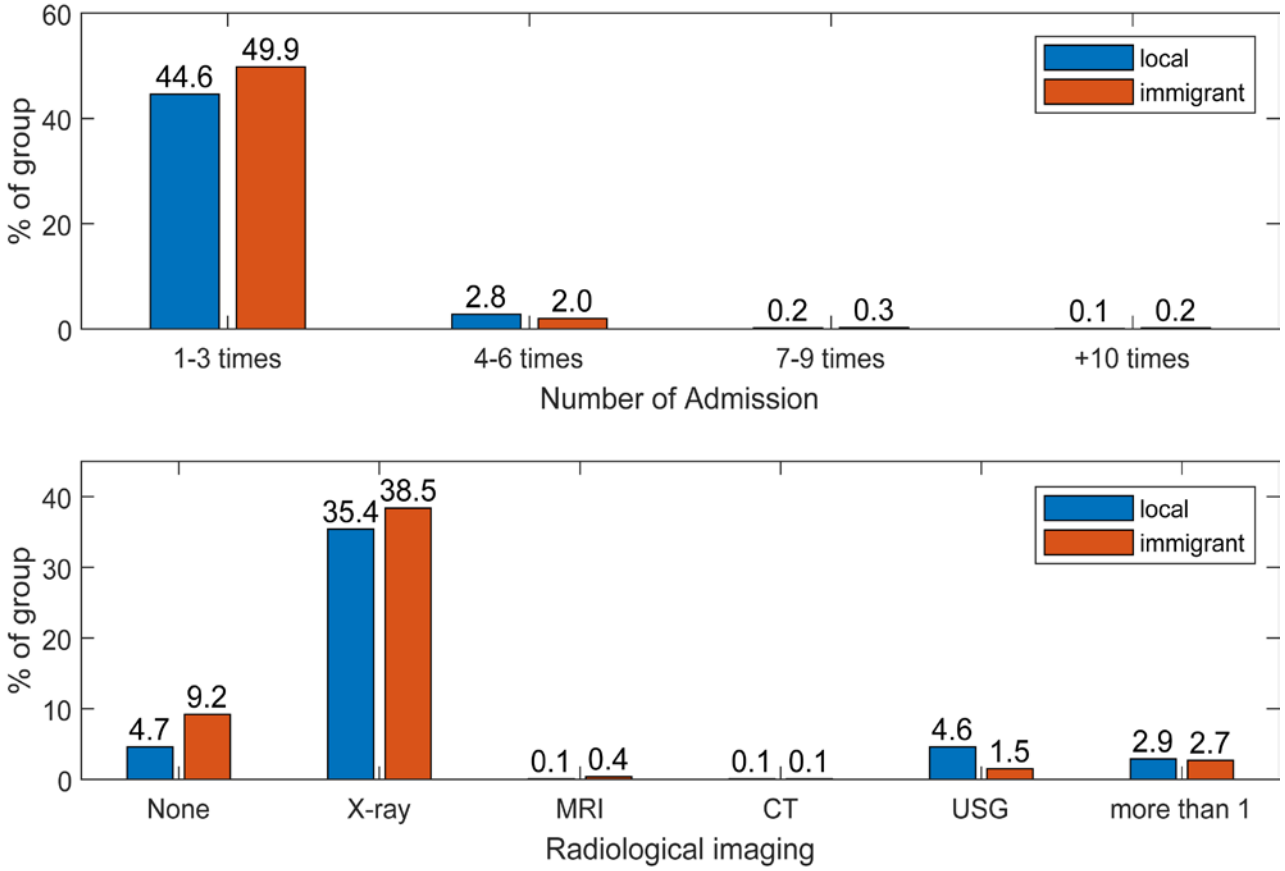

Figure 2. Presentation of the ratio of the patients in terms of number of admission to O&T and utilized radiological imaging

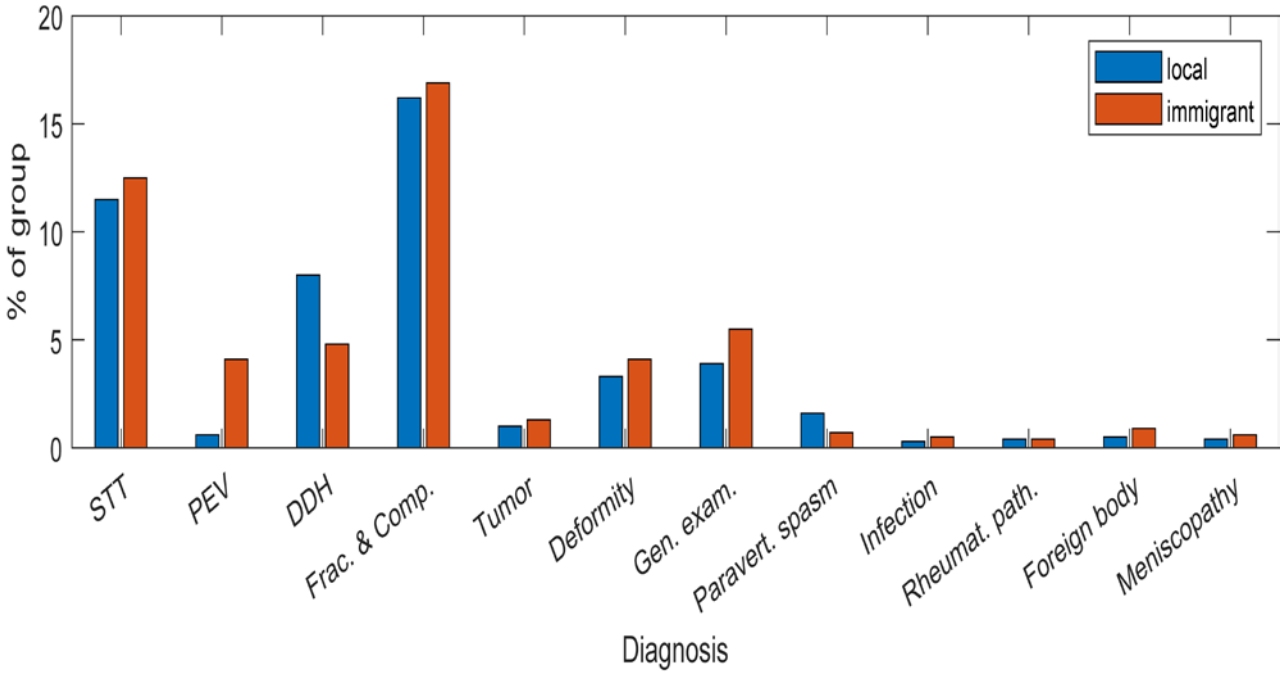

Figure 3. Presentation of the ratio of patients in terms of diagnosis

Table 1. Demographic of data. Bolded values are those with p < 0.05

	Local children		İmmigrant children		Total		p- value
	n	%	n	%	n	%	
Sex							
Female	203	20.12	243	24.08	446	44.20	0.22
Male	278	27.55	285	28.25	563	55.80	
Age							
Infant (0-12 month)	89	8.82	75	7.43	164	16.25	
Toddler (1-2 age)	*75*	7.43	*132*	13.08	207	20.52	**0.02**
Preschool (3-6 age)	86	8.52	95	9.42	181	17.94	
School (7-12 age)	137	13.58	122	12.09	259	25.67	
Adolescent (13-17 age)	94	9.32	104	10.31	198	19.62	
Place of admission							
Orthopedic	481	47.67	478	47.37	959	95.04	**<0.001**
Emergency	*0*	0	*10*	0.99	10	0.99	
Other	*0*	0	*40*	3.96	40	3.96	
Reason for admission							
Atraumatic	204	20.22	218	21.61	422	41.82	0.71
Traumatic	277	27.45	310	30.72	587	58.18	
Treatment method							
Conservative	458	45.39	490	48.56	948	93.95	0.10
Surgical	23	2.28	38	3.77	61	6.05	
	481	47.67	528	52.33	1009	100	

Table 2. The number of applications, the frequency distribution of examinations, and diagnoses

	Local children		İmmigrant children		Total	
	n	%	n	%	n	%
Number of admission						
1-3 times	450	44.60	503	49.85	953	94.45
4-6 times	28	2.78	20	1.98	48	4.76
7-9 times	2	0.20	3	0.30	5	0.50
+10 times	1	0.10	2	0.20	3	0.30
Radiological imaging						
None	47	4.66	93	9.22	140	13.88
X-ray	357	35.38	388	38.45	745	73.84
MRI	1	0.10	4	0.40	5	0.50
CT	1	0.10	1	0.10	2	0.20
USG	46	4.56	15	1.49	61	6.05
More than one	29	2.87	27	2.68	56	5.55
Diagnosis						
STT	116	11.50	126	12.49	242	23.98
PEV	6	0.59	42	4.16	48	4.76
DDH	81	8.03	48	4.76	129	12.78
Fracture and complication	164	16.25	171	16.95	335	33.20
Tumor	10	0.99	13	1.29	23	2.28
Deformity	33	3.27	41	4.06	74	7.33
General examination	39	3.87	56	5.55	95	9.42
Paravertebral spasm	16	1.59	7	0.69	23	2.28
Infection	3	0.30	5	0.50	8	0.79
Rheumatological pathologies	4	0.40	4	0.40	8	0.79
Foreign body	5	0.50	9	0.89	14	1.39
Meniscopathy	4	0.40	6	0.59	10	0.99

Discussion

Immigration is a global issue and can cause changes in the health system of countries. To the best of our knowledge, this is the first study in the literature to determine the differences between immigrant and local children in the department of orthopedics and traumatology (O&T). The main finding of this study provides new evidence about the differences in musculoskeletal health of immigrant children from local children.

In the present study, there was no difference between the first two most commonly diagnosed pathologies (fracture and its complications and soft tissue traumas) in immigrant and local children. The other most common diagnosis was

the general examination for immigrant children, while the DDH was for local children. Immigrant children's admitted for general examinations were relatively more than local children. We think that this is due to differences in education, culture, and expectations of families. Kronenig et al. and Pottie et al. reported that the healthcare team should be aware of cultural differences and expectations during healthcare (1,12). Ethnic differences, geographic location and having a family history, and swaddling were risk factors for DDH (13-15). DDH was included in the national screening program country. We think that the frequent occurrence of DDH in local children may be related to racial differences and swaddling. In addition, immigrant families could be unfamiliar with routine preventive health services.

Immigrant children were more likely to be consulted from different departments ($p<0.001$). This difference thinks that the immigrant children consulted from other departments had additional medical diseases requiring hospitalization. Şahin et al. showed that immigrants' comorbidities were more common (9). In addition, immigrant children were more admitted to the emergency department. Similar to the present study, it has been shown that the immigrant population's admission to the emergency department is higher in Spain (16). Xu et al. pointed out the relation between the utilization of healthcare services by immigrants and immigration reasons (8). As admission to the emergency department is generally associated with acute traumas, we think immigrant children were more exposed to acute trauma, similar to the findings of different studies (17,18). Another reason may be that immigrants do not know which department to apply to due to their lack of social integration (language, education, etc.). Several researchers have recommendations such as directing new immigrant families to the right health services by professional translators in the language they prefer, informing them about urgent and emergent care (19,20), and preparing a health education program by professionals (21).

Oral and dental health studies show that immigrants have inequality in accessing oral health services and experience more frequent oral health problems in Spain (22,23). Newbold et al., contrary to expectations regarding oral health, both native Canadians and foreign nationals reported similar practices (24). Xu et al. reported that outpatient visits were more frequent among international immigrants; however, the number of visits and outpatient treatment costs were lower than those of local people. They stated that this difference was related to health insurance (8). In this study, no significant difference was found between the number of admission to O&T in one year in either group. Since the country's general health insurance finances the health services for the immigrants, this could be the reason for the similar number of admission to the O&T. This number could also be affected by the fact that immigrants can be directly admitted to an emergency department, a primary, secondary, and tertiary health center due to the country's health policy.

MRI and no radiological imaging frequency were higher in immigrant children than in local children. The relatively higher number of children whom admission for general examination in immigrant children increased patients' frequency with no radiological imaging in this group. The increased rate of MRI in immigrant children could be related to the suspected pathologies (STT, tumor, foreign body, and meniscopathy) diagnosed by MRI. The higher frequency of USG in local children may be due to the national screening program for DDH for local children being known to parents. In this study, similar to the literature (25,26), local children were frequently admitted to trauma centers and emergency departments during the school-age period. Sharma et al. prospectively evaluated 791 pediatric patients and reported that admissions were most common during the school-age period, second most frequently during the preschool period, and third most frequently during the toddler period (27). In the present study, immigrant children were admitted more frequently during the toddler period between the ages of one and two to the O&T. This difference suggests that immigrant children during the toddler period are more frequently exposed to trauma. In addition, this difference can be caused by environmental, educational, and socio-cultural differences.

PEV, foreign body, and general examination were the most common diagnoses in immigrant children, while DDH and paravertebral spasms were the most common diagnoses in local children. Apart from the most common diagnoses (fracture and its complications and STT) between the two groups, the costs to the healthcare system were calculated for diagnosis and treatment per patient. The cost of patients admitted with PEV was the highest, followed by those admitted due to a foreign body. One-year conservative treatment of a DDH patient was lower than the cost of a patient with a foreign body. The cost of a patient presenting with paravertebral spasm was the lowest on average. Besides the financial cost to the healthcare system, admission to a tertiary hospital for a general examination without any pathology causes a loss of workforce for the health system and costs to insurance companies. Duramaz et al. stated that meeting the basic needs of immigrants with the right strategies and timely interventions can reduce health expenditures (10).

There are several limitations of this study. First, although this study provides insights into healthcare changes on the east side of the country between local and immigrant children, it is conducted in a single tertiary hospital where it would not be appropriate to universalize the results due to the relatively small sample size. Second, it is a retrospective study. Another limitation is that the immigrant category (economic immigrant, family-class immigrant, or refugee), familial and socio-cultural characteristics, linguistic and religious differences, and residence time of the patients were not included in the study. However, we believe that this study will form the basis for planning multicenter prospective studies in the future.

In conclusion, determining the health status of immigrant children in orthopedics and traumatology will enable countries to take the necessary measures in health policies and improve health services. Education of immigrant and refugee families, using professional translators, and the determination of traditional differences and risk factors in the department of preventive medicine can be provided. As a result of this study, awareness among clinicians and families will increase and provide patients to receive a more efficient health service. We think that this study will also form the basis for future studies focusing on the musculoskeletal health of immigrant children.

Ethical Approval: *This retrospective chart review study involving human participants was in accordance with the ethical standards of the institutional and national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. The Human Investigation Committee (IRB) of the Harran University approved this study (06/09/2021-HRU/21.15.10).*

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