



# Pediatric Emergency Department Visits Related to Home Accident in the Era of COVID-19 Pandemic

## COVID-19 Pandemisi Döneminde Ev Kazası İlişkili Çocuk Acil Servis Başvuruları

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### Abstract

**Introduction:** The Coronavirus disease-2019 pandemic has been caused several physical, mental and psychosocial problems alongside being a respiratory system infection. During pandemic, children were forced to stay at home as a preventative measure. Thus, we aimed to assess the number and characteristics of home accident-related visits in a pediatric emergency department during the pandemic.

**Methods:** This cross-sectional study included all children aged under 18 years who admitted with home accident in two curfew periods and the corresponding periods of previous year. Demographic and clinical data was consisted of age, gender, admission time, time elapsed between accident and pediatric emergency department admission, type of home accident, medical and surgical interventions, length of stay in pediatric emergency department, hospitalization, or intensive care unit admission and mortality. The data of curfew periods was compared with its control periods by using Mann-Whitney U test, t-test or chi-square. The statistical significance was defined as  $p \leq 0.05$ .

**Results:** We enrolled 744 patients. There was no significant difference in age, gender, time elapsed from the accident, ratio of hospitalization between curfew and control periods. The proportions of home accidents among all admissions were higher in two curfew periods ( $p=0.001$  and  $p<0.001$ ). The ratio of poisoning and foreign body ingestions was increased during both two curfew periods (0.7% vs. 0.3%,  $p=0.001$  and 0.7% vs. 0.1%,  $p<0.001$  for poisoning; 0.4% vs. 0.1%,  $p<0.001$  and 0.8% vs. 0.1%,  $p<0.001$  for foreign body ingestion) and the ratio of trauma was increased in the curfew-2 period (1.2% vs. 0.3%,  $p<0.001$ ).

**Conclusion:** We suggested a higher ratio of home accidents especially poisoning and foreign body ingestions in curfew period.

### Öz

**Giriş:** Koronavirüs hastalığı-2019, bir solunum sistemi enfeksiyonu olmasının yanı sıra çok sayıda fiziksel, zihinsel ve psikososyal problemlere yol açmaktadır. Pandemi süresince koruyucu önlem olarak çocuklar evlerinde kalmak zorunda bırakılmıştır. Bu nedenle pandemi süresince ev kazası nedeniyle çocuk acil servis başvurularının sayısını ve özelliklerini değerlendirmeyi amaçladık.

**Yöntemler:** Bu kesitsel çalışmaya sokağa çıkma yasağının olduğu iki periyod ve bu periyodların bir önceki yıl karşılıklarında ev kazası nedeniyle başvuran 18 yaş altı çocuklar dahil edildi. Demografik ve klinik veriler yaş, cinsiyet, başvuru zamanı, çocuk acile başvuruya kadar geçen süre, ev kazasının türü, tıbbi ve cerrahi müdahaleler, acil serviste kalış süresi, hastaneye ya da yoğun bakıma yatış ve mortaliteyi içermekteydi. Sokağa çıkma yasağı periyodlarına ait veriler bir önceki yıl kontrol periyod ile karşılaştırılırken Mann-Whitney U testi, t-testi ya da ki-kare testi kullanıldı. İstatistiksel anlamlılık  $p \leq 0,05$  olarak kabul edildi.

**Bulgular:** Çalışmaya 744 hasta alındı. Sokağa çıkma yasağı periyodları ve kontrol periyodlar arasında yaş, cinsiyet, kazadan sonra geçen süre, hastaneye yatış oranları açısından anlamlı fark saptanmadı. Her iki sokağa çıkma yasağı periyodunda ev kazalarının tüm hastalara oranı kontrol periyoda göre anlamlı olarak yüksekti ( $p=0,001$  vs.  $p<0,001$ ). Her iki sokağa çıkma yasağı süresince zehirlenme ve gastrointestinal sistemde yabancı cisim oranlarında artış saptandı (%0,7 vs. %0,3,  $p=0,001$ ; %0,7 vs. %0,1,  $p<0,001$  zehirlenme için %0,4 vs. %0,1,  $p<0,001$  vs. %0,8 vs. %0,1,  $p<0,001$  gastrointestinal sistemde yabancı cisim için). Travma oranının ise ikinci sokağa çıkma yasağı periyodunda arttığı görüldü (%1,2 vs. %0,3,  $p<0,001$ ).

**Sonuç:** Çalışmamızda sokağa çıkma yasağı periyodlarında ev kazalarının özellikle de gastrointestinal sistemde yabancı cisim ve

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Thus, in case of global disasters such as pandemic the authorities should improve preventative and healthcare strategies to establish a safe environment for children and adolescents.

**Keywords:** Children, COVID-19 pandemics, emergency department, home accidents

## Introduction

The Coronavirus disease-2019 (COVID-19) outbreak was considered as a pandemic by the declaration of the World Health Organization on March 11, 2020.<sup>1</sup> In the same day, the Minister of Health announced the first infected case in Turkey and the nation-wide measures have been promulgated immediately for the infection control.<sup>2,4</sup> School closure was one of the main public health measures which affected especially children and adolescents. Following that, "stay at home" policy was applied officially for those aged  $\leq 20$  years on April 4, 2020.<sup>2,4</sup> In the course of time, the restrictions was repealed gradually since May 31, 2020, but a curfew began again on November 18, 2020 by the increasing number of infected cases.<sup>5,6</sup>

These long periods of home confinement during pandemic can lead to a lack of socialization, longer screen time for education or social media, decreased physical activity, poor diet, disturbed sleep pattern, anxiety, post-traumatic stress disorder, depression, higher risk of domestic abuse or violence and home accidents. Hence, the pandemic has become more complicated by the consequences of these measures on the physical, mental, and emotional health of children and adolescents.<sup>7-12</sup> We hypothesized that the number of home accidents related admissions in our pediatric emergency department (PED) increased during the curfew periods. Thus, we aimed to compare the number and characteristics of patients with home accidents admitted to our PED between April 4-June 1, 2020 and November 18-December 18, 2020 with the same time frame of the previous year.

## Materials and Methods

This cross-sectional study was conducted in PED of University of Health Sciences Turkey, Dr. Behçet Uz Child Disease and Pediatric Surgery Training and Research Hospital after the approval of Local Ethics Committee (January 28, 2021/501) and the written informed consents were obtained from parents. We included patients aged under 18 years who were admitted with home accidents during two curfew periods and the same periods in 2019. The four periods were defined as curfew period-1 (April 4-June 1, 2020), curfew period-2 (November 18-December 18, 2020), control period -1 (April 4-June 1, 2019) and control period-2 (November

zehirlenme oranlarının arttığını gösterdik. Bu nedenle pandemi gibi küresel felaketler durumunda sağlık otoriteleri çocuk ve ergenler için daha güvenli bir çevre yaratmak adına koruyucu hizmetler ve sağlık hizmetleri stratejilerini geliştirmelidir.

**Anahtar Kelimeler:** Çocuklar, COVID-19 pandemisi, acil servis, ev kazaları

18- December 18, 2019). Age, gender, admission time (daytime or night shift), time elapsed between accident and PED admission, type of home accident [trauma, foreign body ingestion (FBI), drowning, electrical injury, poisoning, foreign body in ear, nose, throat, or foreign body aspiration], medical and surgical interventions, length of stay at PED, hospitalization or intensive care unit admission and mortality were obtained from electronic medical records. Also, the data about the localization and type of foreign bodies in respiratory and gastrointestinal tract, requirement for emergent upper gastrointestinal endoscopy or bronchoscopy; type (head, thoracoabdominal, genitourinary, musculoskeletal injury) and severity of trauma; type of poisoning were recorded. The exclusion criteria were missing data, suspected but not-proven radio-opaque FBI or aspirations, intentional poisonings, and injuries.

## Statistical Analysis

The descriptive statistics were presented by mean and standard deviation, median and interquartile range (IQR) or proportions for normally distributed, not normally distributed, and categorical data sequentially. The Mann-Whitney U test, t-test or chi-square test were used for the comparison of curfew and control periods. Statistical analyses were performed by SPSS software version 22.0 (IBM Corp., Armonk, NY) and p-value under 0.05 set as a statistical significance.

## Results

Our PED had 5.339 and 4.675 visits during the curfew period-1 and 2; 19.405 and 21.266 visits during the control period-1 and 2. The total number of visits in the curfew period-1 and curfew period-2 were decreased 72.5% and 78.0% when compared with control periods. Among all admissions, we enrolled 744 patients with home accident. The overall median age was 30 months (IQR: 215 months) and 55.6% of patients were male. The median time elapsed between accident and admission was 1.5 hour (IQR: 2.4 hr) and 511 (68.7%) patients were admitted at night shift. Twenty-eight (3.8%) patients hospitalized. There were no pediatric intensive care unit admission and no mortality. The demographic and clinical characteristics of patients based on four different time periods are summarized in Table 1.

There were 450 (60.5%) trauma, 165 (22.2%) poisoning, 121 (16.2%) foreign body, 5 (0.7%) electrical injuries, 3 (0.3%) burns. The most common injuries were mild traumatic brain injury (mTBI) (n=243, 54.0%) and musculoskeletal injuries (n=96, 21.5%). The types of trauma are shown in Table 2. There were 96 foreign body ingestions which consisted of 31 (32.3%) coins, 21 (21.9%) sharp objects, 14 (14.6%) batteries, 2 (2.1%) single magnets, 25 (26.0%) unclassified blunt objects and 3 (3.1%) food. Upper gastrointestinal endoscopy was performed in 9 (9.4%) patients. Table 3 presented the type and location of ingested foreign bodies

and the number of endoscopy procedures according to four different periods. Among foreign body in ENT and respiratory tract, only one patient in the curfew period-2 was underwent bronchoscopy. The characteristics of patients with poisoning were shown in Table 4. The proportion of trauma in Curfew-2 period was significantly higher than Control-2 period (1.2% vs. 0.3%, p<0.001). But the proportions of trauma in Curfew-1 and Control-1 period were similar (1.4% vs. 1.3%, p=0.663). During the Curfew-1 and Curfew-2 periods, the proportions of poisoning and FBI were higher when compared with their control periods (0.7% vs. 0.3%, p=0.001 and 0.7% vs. 0.1%,

**Table 1. Comparison of the demographic and clinical characteristics of patients at curfew and control periods**

	Curfew period-1	Curfew period-2	Control period-1	Control period-2	p-value
<b>Home accidents/Total admissions, n/n</b>	139/5.339	131/4.675	365/19.405	109/21.266	0.001 <sup>a</sup> <0.001 <sup>b</sup>
<b>Age (months), median (IQR)</b>	36 (38)	26 (35)	30 (50)	27 (36)	0.308 <sup>a</sup> 0.705 <sup>b</sup>
<b>Age groups*, n (%)</b>					
<2 years	49 (35.32)	59 (45.0)	152 (41.6)	49 (45.0)	
(2-5 years)	60 (43.2)	52 (39.7)	112 (30.7)	41 (37.6)	0.012 <sup>a</sup>
(6-11 years)	27 (19.4)	17 (13.0)	72 (19.7)	17 (15.6)	0.937 <sup>b</sup>
(12-18 years)	3 (2.2)	3 (2.3)	29 (7.9)	2 (1.8)	
<b>Gender, n (%)</b>					
Male	76 (54.7)	80 (61.1)	204 (55.9)	54 (49.5)	0.806 <sup>a</sup>
Female	63 (45.3)	51 (38.9)	161 (44.1)	55 (50.5)	0.073 <sup>b</sup>
<b>Time elapsed from accident (hr), median (IQR)</b>	1.5 (2.5)	1.0 (2.0)	1.5 (2.5)	1.0 (2.5)	0.338 <sup>a</sup> 0.409 <sup>b</sup>
<b>Admission time, n (%)</b>					
Night shift	111 (79.9)	87 (66.4)	238 (65.2)	75 (68.8)	0.001 <sup>a</sup>
Day-time shift	28 (20.1)	44 (33.6)	127 (34.8)	34 (31.2)	0.693 <sup>b</sup>
<b>Type of home accident, n (%)</b>					
Trauma	74 (53.2)	58 (44.2)	254 (69.6)	64 (58.7)	
Poisoning	37 (26.6)	32 (24.4)	67 (18.4)	29 (26.6)	
Foreign body	28 (20.1)	25 (26.7)	43 (11.9)	15 (13.8)	
Ear-nose-throat	4 (2.9)	5 (3.8)	6 (1.6)	3 (2.8)	
Respiratory tract	1 (0.7)	5 (3.8)	1 (0.3)	-	0.007 <sup>a</sup>
Gastrointestinal tract	23 (16.6)	25 (19.2)	36 (9.8)	12 (11.0)	0.095 <sup>b</sup>
Electrical injury	-	3 (2.3)	1 (0.3)	1 (0.9)	
Burn	-	3 (2.3)	-	-	
<b>Length of stay at PED (hr), mean (SD)</b>	1.9±4.5	6.6±7.7	1.8±5.4	3.6±8.2	0.858 <sup>a</sup> 0.004 <sup>b</sup>
<b>Hospitalization, n (%)</b>	10 (7.2)	4 (3.1)	11 (3.0)	3 (2.7)	0.125 <sup>a</sup> 0.888 <sup>b</sup>

<sup>a</sup>Comparison of curfew period-1 and control period-1, <sup>b</sup>Comparison of curfew period-2 and control period-2,  
\*Age groups according to National Institute of Child Health and Human Development Pediatric Terminology  
SD: Standard deviation, PED: Pediatric emergency department, IQR: Interquartile range

**Table 2. Type of trauma admissions according to curfew and control periods**

	Curfew period-1 (n=74)	Curfew period-2 (n=58)	Control period-1 (n=254)	Control period-2 (n=64)	p-value
<b>Mild TBI, n (%)</b>	28 (37.8)	43 (74.1)	138 (54.3)	34 (53.1)	
<b>Moderate-severe TBI, n (%)</b>	1 (1.4)	-	17 (6.7)	1 (1.6)	
<b>Thoracoabdominal injury, n (%)</b>	1 (1.4)	-	8 (3.2)	1 (1.6)	
<b>Genitourinary injury, n (%)</b>	3 (4.1)	1 (1.7)	3 (1.2)	1 (1.6)	0.002 <sup>a</sup>
<b>Maxillofacial injury, n (%)</b>	8 (10.8)	4 (6.8)	17 (6.7)	7 (10.9)	0.010 <sup>b</sup>
<b>Musculoskeletal injury, n (%)</b>	30 (40.5)	10 (17.2)	49 (19.3)	12 (18.8)	
<b>Multiple trauma, n (%)</b>	3 (4.1)	-	22 (8.7)	29 (26.6)	

<sup>a</sup>Comparison of curfew period-1 and control period-1, <sup>b</sup>Comparison of curfew period-2 and control period-2, TBI: Traumatic brain injury

**Table 3. The clinical features of foreign body ingestions according to curfew and control periods**

	Curfew period-1 (n=23)	Curfew period-2 (n=25)	Control period-1 (n=36)	Control period-2 (n=12)	p-value
<b>Type of foreign body, n (%)</b>					
Coin	6 (26.1)	7 (28.0)	14 (38.9)	4 (33.3)	
Sharp object	6 (26.1)	6 (24.0)	7 (19.4)	2 (16.7)	
Battery	5 (21.7)	4 (16.0)	3 (8.3)	2 (16.7)	0.412 <sup>a</sup>
Single magnet	-	1 (4.0)	1 (2.8)	-	0.951 <sup>b</sup>
Unclassified blunt object	6 (26.1)	7 (28.0)	8 (22.2)	4 (33.3)	
Food	-	-	3 (8.4)	-	
<b>Location of foreign body, n (%)</b>					
Esophagus	3 (13.0)	1 (4.0)	2 (5.6)	1 (8.3)	
Stomach	6 (26.1)	8 (32.0)	8 (22.2)	2 (16.7)	
Intestines	10 (43.5)	8 (32.0)	20 (55.5)	7 (58.3)	0.673 <sup>a</sup>
Unknown	4 (17.4)	8 (32.0)	6 (16.7)	2 (16.7)	0.314 <sup>b</sup>
<b>Endoscopy, n (%)</b>					
	1 (4.3)	5 (20.0)	1 (2.8)	2 (16.7)	0.054 <sup>a</sup> 0.661 <sup>b</sup>

<sup>a</sup>Comparison of curfew period-1 and control period-1, <sup>b</sup>Comparison of curfew period-2 and control period-2

**Table 4. The clinical features of poisonings according to curfew and control periods**

	Curfew period-1 (n=37)	Curfew period-2 (n=32)	Control period-1 (n=67)	Control period-2 (n=29)	p-value
<b>Type of poison, n (%)</b>					
Drugs	21 (56.8)	13 (40.7)	34 (50.7)	22 (75.9)	
Caustic-corrosive	15 (40.5)	14 (43.8)	25 (37.3)	4 (13.8)	
Hydrocarbon	-	3 (9.4)	4 (6.0)	2 (6.9)	0.528 <sup>a</sup>
Alcohol	-	1 (3.1)	1 (1.5)	1 (3.4)	0.022 <sup>b</sup>
Organophosphate	-	-	1 (1.5)	-	
Others	1 (2.7)	1 (3.1)	2 (3.0)	-	
<b>Interventions, n (%)</b>					
Gastric lavage	4 (10.8)	2 (6.3)	8 (11.9)	8 (27.6)	
Activated charcoal	12 (32.4)	3 (9.4)	15 (22.4)	9 (31.0)	0.489 <sup>a</sup>
Antidote	-	-	2 (3.0)	-	0.831 <sup>b</sup>
Haemodialysis	-	-	1 (1.5)	1 (3.4)	
<b>Time elapsed from poisoning (hr), median (IQR)</b>					
	1.0 (1.5)	1.0 (1.0)	1.5 (2.0)	1.0 (1.6)	0.027 <sup>a</sup> 0.651 <sup>b</sup>

<sup>a</sup>Comparison of curfew period-1 and control period-1, <sup>b</sup>Comparison of curfew period-2 and control period-2, IQR: Interquartile range

p<0.001 for poisoning; 0.4% vs 0.1%, p<0.001 and 0.8% vs 0.1%, p<0.001 for FBI).

## Discussion

To our knowledge, this is the first study from Turkey focused on the effect of pandemic restrictions in terms of pediatric home accident. We found that patients presented with home accident proportionally increased during the curfew periods despite there was no significant rise in number. Our data was supported by the study of Bressan et al.<sup>10</sup> that incidence rate ratio of home accidents in curfew period was higher than the same period of previous year. Similarly, it was reported that the proportion of domestic accidents in a tertiary pediatric surgical unit increased during the pandemic compared with two previous years.<sup>13</sup> Also, a study of extremity fractures in children and adults reported an increment of home accidents among injury mechanisms during pandemics.<sup>14</sup>

Another main finding of our study was increased percentage of poisoning and FBI during both curfew periods. Similarly, a study of PED utilization found a higher number of ingestion and poisoning in the social distancing period.<sup>15</sup> In accordance with our results, Levine et al.<sup>16</sup> reported an increased incidence rate ratio of pediatric exploratory ingestion calls at school hours in 2020. Unlike, a study of exposures and suspected intoxication suggested that the number of cases and the ratio of domestic accidents didn't change during the first months of 2020.<sup>17</sup> But it is difficult to comment on this result from the perspective of pediatric home accidents as half of the study population consisted of adults. Moreover, we emphasized a rise in poisoning with caustic-corrosive materials during the second curfew period and we believe that it was related to the frequent use of household cleaners as a transmission-based precaution at home.

Regarding FBIs, a study from Italy was in accordance with our findings. The authors reported that FBIs nearly doubled in the

first months of pandemic. Additionally, they emphasized a rise in the number of upper gastrointestinal endoscopy.<sup>18</sup> On the other hand, we didn't observe a significant increase in the endoscopic procedures. An explanation for this discrepancy may be that the high-risk FBIs such as batteries, sharp objects and caustic substances were increased in this study while the type of FBIs didn't change in our study. Distinctly, it was reported that the rate of hospital admission with FBI and the rate of hospitalization for endoscopic procedures were similar for the last five years. Besides they suggested an increased rate of battery ingestions in the first two months of school closure.<sup>19</sup> Considering the abovementioned approach based upon the type of foreign body, a higher endoscopic procedure rate would expect for this study. Nevertheless, the timing of FBI is another determining factor to make a decision about upper gastrointestinal endoscopy and these two studies had no data about the time elapsed between ingestion and admission.<sup>20,21</sup> But the strength of our study was that there was no significant difference in time elapsed from accident and the ratio of endoscopic procedures during curfew periods. Trauma is one of the major non-infectious causes of PED visits. Although the number of PED admissions sharply reduced in the era of COVID-19 pandemic, relatively increased trauma-related visits were reported.<sup>10,22,23</sup> Compatible with the current literature, there was a higher rate of trauma-related admissions for the second curfew period in our study. Furthermore, we pointed out proportionally increased mTBI. Also another study of pediatric injuries during lockdown pointed out an apparent rise of mTBI in a level-1 trauma center.<sup>24</sup> Contrarily, Goyal et al.<sup>25</sup> reported that mild and moderate head injuries reduced during pandemic. But nearly half of the study population consisted of road traffic accidents instead of home accidents. In addition to all these, interestingly we didn't observe a distinct change in trauma-related visits during the first curfew period.

The rise of pediatric home accident during curfew can be explained by several factors. Spending a longer time at home filled with dangerous materials such as electronic devices, batteries, drugs, household cleaners and plants could establish a high-risk environment for poisoning and FBIs. Although the teleworking extended the time at home during pandemic, it might lead the lack of parental supervision. Also, inequalities of social and economic conditions and new family lifestyle after pandemic attended through the adaptation process. For handling this issue the education of parents about maintenance of a friendly physical and social environment is crucial.

Our single-center study was limited with a retrospective design. Although our data may not be generalized due to small sample size, our hospital is the only public children's

hospital in İzmir and we can speculate that parents preferred to admit our PED instead of other hospitals overflowed by adults with COVID-19. Beside our hospital was not a trauma center and patients with burn managed in the burn unit. Hence there was limited number of patients with major or multiple traumas and burns. But then, we aimed to observe the changes in home accident-related visits through the curfew periods.

## Conclusion

Pediatric home accident-related visits prominently increased in our PED during the curfew periods. Thus, the individual and collective level of awareness about home accidents should be raised during the pandemic and the preventative strategies for home accidents should be revised by the healthcare authorities and social services.

## Ethics

**Ethics Committee Approval:** This cross-sectional study conducted in PED of University of Health Sciences Turkey, Dr. Behçet Uz Child Disease and Pediatric Surgery Training and Research Hospital after the approval of Local Ethics Committee (January 28, 2021/501).

**Informed Consent:** Written informed consents were obtained from parents.

**Peer-review:** Internally and externally peer-reviewed.

## Authorship Contributions

Surgical and Medical Practices: A.E., B.K.Ç., E.U., F.A., İ.G., H.A., Concept: A.E., F.A., İ.G., H.A., Design: A.E., E.U., İ.G., Data Collection or Processing: A.E., B.K.Ç., Analysis or Interpretation: A.E., İ.G., Literature Search: A.E., F.A., H.A., Writing: A.E., E.U.

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