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AN EXAMINATION OF PEDIATRIC PATIENTS PRESENTING TO THE EMERGENCY DEPARTMENT DUE TO DOMESTIC ACCIDENTS DURING THE PANDEMIC PERIOD

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Abstract

Objectives: This study aims to examine pediatric emergency department visits due to domestic accidents during the COVID-19 pandemic. It focuses on analyzing the clinical features, underlying causes, and parental attitudes during increased home confinement.

Materials and Methods: This prospective observational study investigates the impact of pandemic-related lockdowns on children and parents, specifically their association with domestic accidents. Patients under 18 years old, who present with domestic accidents and with parental consent, were included. Data collected included demographics, trauma mechanisms, injury locations, and emergency department outcomes. After discharge, parents were surveyed about their educational and employment status, behavioral changes in their children, and perceptions of accident rates during the pandemic.

Results: The median age of patients was 5 years (1-11), with 34.5% (n=20) being female. Falls were the most common cause of trauma (79.3%, n=46), with head injuries occurring in 44.8% (n=26). The majority (91.4%, n=53) attributed the accidents to carelessness. Additionally, 60.3% (n=35) reported behavioral changes in their children due to staying at home, and 74.1% (n=15) believed domestic accidents increased during the pandemic. Behavioral changes were particularly notable among school-age children ($p<0.001$). Families with sibling care, lower parental education levels, and higher hospital admission rates had increased behavioral changes ($p=0.020$, $p=0.008$, $p<0.001$, $p=0.011$).

Conclusion: The quarantine period during the pandemic significantly impacted both parents and children, increasing the risk of domestic accidents. The study highlights that caregiver awareness and education are crucial in preventing such incidents. Regular parental training at community health centers can reduce accident frequency and improve outcomes.

Keywords: Pandemics, COVID-19, quarantine, home accidents, pediatrics, behavior.

Introduction

Trauma is one of the leading causes of death and disability among children. It is estimated that approximately 1 million children die each year due to accidents, and although the majority of these deaths occur in developing countries, accidents and trauma account for nearly half of child deaths even in developed countries. [1] While the causes of accidents vary between countries, domestic accidents rank high among them. [2] Most domestic accidents stem from preventable causes, often due to Carelessness in home safety. Parental attitudes and behaviors are also key factors in domestic accidents. [3]

On March 11, 2020, the World Health Organization declared the COVID-19 outbreak, which was first reported in Wuhan, China, a pandemic. [4] As a result of this pandemic, many countries implemented restrictions and lockdowns, and Turkey was one of these countries. Following the first reported case, a nationwide lockdown was enforced in Turkey starting on March 16. These quarantine measures not only changed parents' hospital visit habits but also led to more time being spent at home with their children. [5] Especially, the increased time children spend at home during school closures may contribute to a rise in domestic accidents. This process has impacted not only school-age children but all age groups equally. [6] As a result of trauma-related admissions, the amount of radiation exposure these children have experienced has also increased. [7]

In our study, we aimed to examine emergency department (ED) visits due to domestic accidents involving children who stayed at home during the pandemic period, and to highlight the clinical features of these accidents as well as parents' attitudes toward this issue.

Materials and Methods

Our study is prospective and observational research conducted with the approval of the Ankara City Hospital No. 1 Clinical Research Ethics Committee (Ethics Committee Decision No: E1-21-1708). Trauma patients who presented to the ED between April 29, 2021, and May 17, 2021, were included in the study. During the indicated period, the longest closure period (complete quarantine) of the pandemic occurred, and pediatric patients who presented to the emergency department due to home accidents were assessed. Informed consent was obtained from the parents of all included cases.

These were our inclusion criteria:

- Patients under 18 years of age,

- The ED being the first point of care,

- Admission to the ED due to a domestic accident,

These were our exclusion criteria:

- Patients over 18 years of age,

- Those who did not provide consent to participate in the study,

- Those who did not respond to questions during the telephone interview after the ED visit. (Figure 1.)

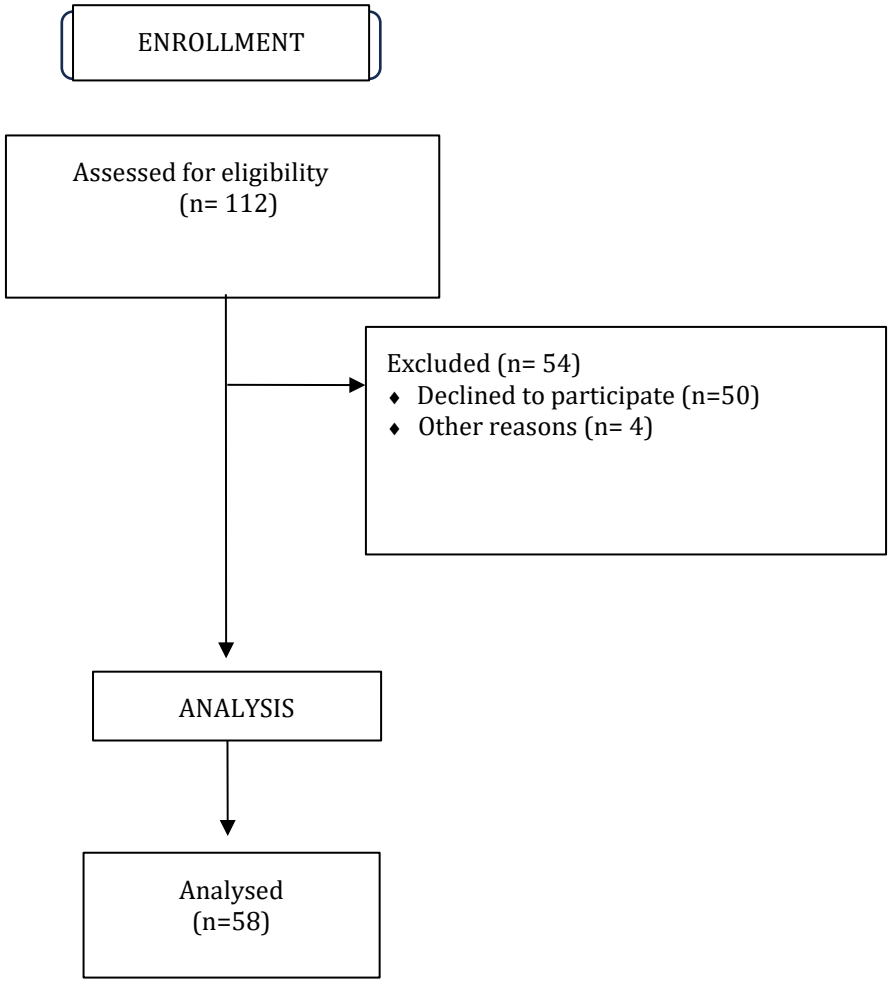

Figure 1. Flow diagram

During the initial visit, data were recorded on age, gender, chronic diseases, trauma mechanisms, trauma locations (body regions such as head, maxillofacial, spinal, thoracic, abdominal, extremity, genitourinary), and the outcome in the ED (hospitalization, discharge, surgery). The researchers did not intervene in the treatment process of the cases in the ED.

On the seventh day following the ED visit, parents of the included cases were contacted by telephone, and a survey was conducted. The survey questions included whether the children attended school, the education and employment status of the parents, and whether these conditions changed during the pandemic. Additional questions were asked about who provided the child's care (mother, father, grandparent, sibling, nanny), whether staying at home led to behavioral changes in the child, and whether domestic accidents increased during the lockdown periods of the pandemic. All responses were recorded in the study form.

In this study, data from the parents of pediatric patients presenting to the emergency department due to domestic accident-related trauma were recorded after obtaining informed consent. The treatment and follow-up algorithm was not altered. Seven days after discharge, parents were contacted by phone and asked to complete a survey. Information from those who agreed to participate was recorded and included in the final analysis.

The data obtained from the study were analyzed using the Statistical Package for Social Sciences (SPSS) version 22.0. Descriptive analyses were presented as number (n) and percentage (%) for categorical data and as median (minimum and maximum) for numerical data. Pearson's Chi-Square test was used to compare categorical variables. The normality of the distribution of numerical data was evaluated with the Kolmogorov-Smirnov and Shapiro-Wilk tests. The Mann-Whitney U Test was used to assess the distribution of numerical data in two independent groups that did not show a normal distribution. Spearman correlation analysis was used to measure the levels of association. A p-value of less than 0.05 was considered statistically significant, with a 95% confidence interval applied in all tests.

Results

The study was completed with a total of 58 patients, with a median age of 5 years (1-11). Of the patients, 34.5% (n=20) were female, and 12.1% (n=7) had chronic diseases. The most common cause of trauma was falls at a rate of 79.3% (n=46), and the most frequent trauma site was head trauma at 44.8% (n=26). The rate of patients discharged without hospital admission was 74.1% (n=43), and the rate of those attending school was 43.1% (n=33). The proportion of mothers with a university-level education was 17.2% (n=10), while the proportion of fathers with a university-level education was 34.5% (n=20). The employment rate of mothers was 13.8% (n=8), and that of fathers was 86.2% (n=50); during the pandemic, the maternal employment rate was 3.4%

(n=2), and the paternal employment rate was 6.9% (n=4). The rate of care provided by someone other than the mother was 15.5% (n=9) for fathers and 6.9% (n=4) for siblings. The proportion of those who believed the accident was due to carelessness was 91.4% (n=53). The rate of those who reported that staying at home changed their child's behavior was 60.3% (n=35). The proportion of those who believed that domestic accidents increased during the pandemic was 74.1% (n=15). The median number of siblings was found to be 1 (0-7) (Table 1).

Patients with extremity trauma had lower rates of head and maxillofacial trauma ($p<0.001$, $p=0.041$). The rate of hospital admissions was higher in patients with abdominal trauma ($p=0.016$). Patients with head trauma had lower rates of school attendance ($p=0.025$), while those with extremity trauma had higher rates of school attendance ($p=0.015$). The educational level of fathers was lower in patients with abdominal trauma ($p=0.016$). In patients with extremity trauma, the rate of those who reported that staying at home changed their child's behavior was higher ($p=0.026$), while it was lower in patients with head trauma ($p=0.011$) (Table 2).

In children attending school, the rates of those with spinal trauma, mothers who worked, and those who reported that staying at home changed their child's behavior were found to be higher ($p=0.041$, $p=0.049$, and $p<0.001$, respectively).

In children cared for by their siblings, the rates of abdominal trauma, hospital admissions, mothers and fathers with an education level of middle school or below, unemployed fathers, and those who reported that staying at home changed their child's behavior were higher ($p=0.007$, $p=0.020$, $p=0.008$, $p<0.001$, <0.001, and $p=0.011$, respectively) (Table 3).

The median age of patients with head trauma and those who experienced trauma due to falling was lower ($p=0.025$, $p=0.029$), while the median age of those with spinal and extremity trauma, school-going children, and those who reported that staying at home changed their child's behavior was higher ($p=0.008$, $p=0.014$, $p<0.001$, and $p<0.001$, respectively) (Table 4).

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Table 1. Sociodemographic characteristics of the study

	%	n
Age (years)		
Median (min-max)	5 (1-11)	
Sex		
Female	34.5	20
Male	65.5	38
Chronic Disease		
Yes	12.1	7
No	87.9	51
Cause of Trauma		
Fall	79.3	46
Sharp/penetrating instrument	6.9	4
Fall from height	6.9	4
Collision	5.1	3
Pulling	1.7	1
Injury Location		
Head trauma	44.8	26
Extremity trauma	34.5	20
Maxillofacial trauma	12.1	7
Abdomen trauma	10.3	6
Spine trauma	5.2	3
Thorax trauma	1.7	1
Emergency Department Outcome Status		
Discharged	74.1	43
Admitted to service	12.1	7
Discharged at their request	8.6	5
Admitted to intensive care unit	5.2	3
Child School Attendance Status		
Yes	43.1	33
No	56.9	25
Mother's Education Level		
Illiterate	19.0	11
Primary school	1.7	1
Middle school	17.2	10
High school	44.8	26
University	17.2	10
Father's Education Level		
Illiterate	15.5	9
Primary school	5.2	3
Middle school	5.2	3
High school	39.7	23
University	34.5	20
Mother's Employment Status		
Yes	13.8	8
No	86.2	50
Father's Employment Status		
Yes	13.8	8
No	86.2	50
Mother's Employment During the Pandemic		
Yes	3.4	2
No	96.4	56
Father's Employment During the Pandemic		
Yes	6.9	4
No	93.1	54
Caregiver		
Mother	100	58
Father	15.5	9
Grandmother	6.9	4
Sibling	6.9	4
What do you think is the cause of the accident?		
Carelessness	91.4	53
Non-Carelessness reasons	8.6	5

Has staying at home changed your child's behavior?		
Yes	60.3	35
No	39.7	23
Do you think home accidents increased during the pandemic?		
Yes	74.1	15
No	25.9	43

Table 2. Evaluation of Head. Abdominal. and Extremity Trauma with Study Parameters

	Head trauma		**Abdominal trauma**		**Extremity Trauma**	
	Yes	**No**	**Yes**	**No**	**Yes**	**No**
Head trauma						
Yes	-	-	16.7 (1)	48.1 (25)	0 (0)	68.4 (26)
No			83.3 (5)	51.9 (27)	100 (20)	31.6 (12)
p			0.143		**<0.001**	
Maxillofacial Trauma						
Yes	3.8 (1)	18.8 (6)	0 (0)	13.5 (7)	0 (0)	18.4 (7)
No	96.2 (25)	81.3 (26)	100.0(6)	86.5 (45)	100 (20)	81.6 (31)
p	0.083		0.338		**0.041**	
Outcome Status						
Hospital Admission	23.1 (6)	28.1 (9)	66.7 (4)	21.2 (11)	75.0(15)	73.7 (38)
Discharge	76.9 (20)	71.9 (23)	33.3 (2)	78.8 (41)	25.0 (5)	26.3 (10)
p	0.662		**0.016**		0.913	
School Attendance Status						
Yes	26.9 (7)	56.3 (18)	50.0 (3)	42.3 (22)	65.0(13)	31.6 (12)
No	73.1 (19)	43.8 (14)	50.0 (3)	57.7 (30)	35.0 (7)	68.4 (26)
p	**0.025**		0.719		**0.015**	
Mother's Education Level						
Middle School and Below	65.4 (17)	59.4 (19)	50.0 (3)	63.5 (33)	45.0 (9)	34.2 (13)
High School and Above	34.6 (9)	40.6 (13)	50.0 (3)	36.5 (19)	55.0(11)	65.8 (25)
P	0.639		0.520		0.421	
Father's Education Level						
Middle School and Below	80.8 (21)	68.8 (22)	66.7 (4)	21.2 (11)	25.0 (5)	26.3 (10)
High School and Above	19.2 (5)	31.3 (10)	33.3 (2)	78.8 (41)	75.0(15)	73.7 (28)
p	0.299		**0.016**		0.913	
Has staying at home changed your child's behavior?						
Yes						
No	42.3 (11)	75.0 (24)	66.7 (4)	59.6 (31)	80.0(16)	50.0 (19)
	57.7 (15)	25.0 (8)	33.3 (2)	40.4 (21)	20.0 (4)	50.0 (19)
p	**0.011**		0.738		**0.026**	

(%): frequency, min: minimum, max: maximum, p-value was determined using the Chi-Square test.

Table 3. Evaluation of School Attendance Status and Caregiver Data in Relation To The Study Parameters

	School Attendance Status		**Sibling Caregiver**	
	Yes	**No**	**Yes**	**No**
Spinal trauma				
Yes	12.0 (3)	0 (0)	0 (0)	5.6 (3)
No	88.0 (22)	33 (100)	100 (4)	94.4 (51)
p	**0.041**		0.628	
Abdominal trauma				
Yes	12.0 (3)	9.1 (3)	50.0 (2)	7.4 (4)
No	88.0 (22)	90.9 (30)	50.0 (2)	92.6 (50)
p			**0.007**	
Outcome Status				
Hospital Admission	28.0 (7)	24.2 (8)	75.0 (3)	22.2 (12)
Discharged	72.0 (18)	75.8 (25)	25.0 (1)	77.8 (42)
p	0.746		**0.020**	
School Attendance Status Yes				
No	-	-	0 (0)	46.3 (25)
			100 (4)	53.7 (29)
p			0.071	
Mother's Education Level				
Middle School and Below	24.0 (6)	48.5 (16)	100 (4)	33.3 (18)
High School and Above	76.0 (19)	51.5 (17)	0 (0)	66.7 (36)
p	0.057		**0.008**	
Father's Education Level				
Middle School and Below	16.0 (4)	33.3 (11)	100 (4)	20.4 (11)
High School and Above	84.0 (21)	66.7 (22)	0 (0)	79.6 (43)
p	0.135		**<0.001**	
Mother's Employment Status				
Yes				
No	24.0 (6)	6.1 (2)	0 (0)	14.8 (8)
	76.0 (19)	93.9 (31)	100 (4)	85.2 (46)
p	**0.049**		0.407	
Father's Employment Status				
Yes				
No	92.0 (23)	81.8 (27)	0 (0)	3.7 (2)
	8.0 (2)	18.2 (6)	100 (4)	96.3 (52)
p	0.265		**<0.001**	
Did staying at home change your child's behavior?				
Yes	96.0 (24)	33.3 (11)	0 (0)	64.8 (35)
No	4.0 (1)	66.7 (22)	100 (4)	35.2 (19)
p	**<0.001**		**0.011**	

(%): frequency, min: minimum, max: maximum, p value has been determined by Chi-square test.

Table 4. Evaluation of study working parameters with head, abdominal and extremity trauma.

	Age	**Cost**
	Median (min-max)	**Median (min-max)**
Head trauma		
Yes	3 (1-11)	173 (17-510)
No	7 (1-11)	161 (17-1641)
p	**0.025**	0.569
Abdominal trauma		
Yes	5 (1-10)	595 (127-791)
No	5 (1-11)	148 (17-1641)
p	0.970	**0.006**
Spine trauma		
Yes	10 (10-10)	555 (189-695)
No	5 (1-11)	157 (17-1641)
p	**0.008**	0.112
Extremity trauma		
Yes	7 (1-11)	157 (20-1641)
No	3 (1-11)	188 (17-791)
p	**0.014**	0.998
Outcome Status		
Hospital Admission	6 (1-11)	564 (137-1641)
Discharged	5 (1-11)	126 (17-695)
p	0.886	**<0.001**
School Attendance Status		
Yes	8 (5-11)	220 (57-1523)
No	3 (1-6)	138 (17-1641)
p	**<0.001**	0.121
Did staying at home change your child's behavior?		
Yes	7 (1-11)	177 (20-1523)
No	2 (1-8)	147 (17-1641)
P	**<0.001**	0.677
Trauma causes		
Fall	4 (1-10)	165 (17-1641)
Other causes	6 (3-11)	101 (20-791)
P	**0.029**	0.867
Father's Education Level		
Middle School and Below	5 (1-11)	472 (20-1641)
High School and Above	5 (1-11)	139 (17-1523)
p	0.907	**0.040**

(%): frequency, min: minimum, max: maximum, p value was determined using the Mann-Whitney U test.

Discussion

Our study results show that male children experienced more frequent domestic accidents, with falls being the most common mechanism and head trauma being the most frequent trauma localization. Parents overwhelmingly believed that the domestic accident was due to their carelessness, and it was observed that a significant portion of children exhibited behavioral changes during the pandemic period. Additionally, there was an inverse relationship between parental education level and trauma severity and outcomes. Raising awareness of home accidents will also benefit preventive medicine and public health. The secondary aim of our study is to demonstrate the value of preventative medicine.

Although the pandemic altered hospital admission habits, with overall ED visits decreasing, the hospitalization rate increased. [8-9] With this shift in healthcare utilization, changes in the epidemiology of trauma were also observed. A similar study conducted in Morocco suggested that children around 7 years of age were more frequently exposed to domestic accidents. [10] In a study by Nabian and colleagues, which examined the epidemiological characteristics of pediatric trauma during the pandemic, children aged 9 were found to experience trauma more frequently, both during the pandemic and before it. [11] Likewise, a multicenter cohort study conducted in Italy found the average age of children exposed to domestic accidents to be 7 years, while in our study, it was 5 years. [12] As children grow older, they are more frequently exposed to trauma due to their sense of exploration and impulses. [13]

It is well established in the literature that male children are more frequently exposed to trauma, and our study findings were consistent with these data. [12,14] The higher rate of trauma exposure among male children is expected, given their naturally more active behavior. [13]

When examining the literature, it is evident that falls are the most common cause of domestic accidents, and our study findings are consistent with the existing literature. [10,12] No significant change in the mechanism of falls was observed between the pandemic and pre-pandemic periods. However, the increase in domestic accidents can be attributed to the fact that home environments were not adequately adjusted as parents adopted remote working arrangements. [15] The majority of parents in our study believed that the domestic accident was due to their carelessness, and about two-thirds thought their children experienced behavioral changes. The quarantine period significantly increased stress levels among individuals. [16] Elevated stress levels directly or indirectly affected children through their parents. The reduction in social stimuli and physical activity during quarantine resulted in more frequent behavioral changes in children, which also influenced parental attitudes on this matter. [17-19] Furthermore, most parents believed that domestic accidents increased during the quarantine period, a view supported by literature. [9]

When examining the association between trauma localizations in domestic accidents, children with head trauma were less likely to have extremity trauma. The median age of children with head trauma was lower, while those with abdominal trauma had higher hospitalization rates. The literature indicates that extremity trauma is generally the most common injury in domestic accidents. [11,20] The lower median age of our patients compared to the literature may explain the higher prevalence of head trauma in our study. The education level of parents of children with abdominal trauma was also found to be lower. Children cared for by someone other than a parent (e.g., a sibling) were more likely to experience abdominal trauma and had higher hospitalization rates. These findings suggest that the education and awareness levels of both children and parents are directly related to the severity and type of domestic accidents. In our study population, the mothers' education level was generally low, which may explain why the difference was observed in fathers' education levels. It is well known that lower education levels lead to a higher frequency of domestic accidents and are associated with lower first aid knowledge following accidents. [21] In unexpected stressful situations such as quarantine, regular parental training sessions provided at community health centers could help reduce the likelihood of potential adverse outcomes. [22]

Our study is limited by being a single-center experience with a relatively small sample size. However, this limitation arises from the fact that the study focuses solely on the quarantine period, restricting the number of eligible cases. Although the study was conducted at one of Turkey’s largest hospitals, which generally manages more complex cases and receives fewer direct admissions, the findings still provide valuable insights into the impact of quarantine on domestic accidents. Nevertheless, the generalizability of the results remains limited.

Our study results, in line with the literature, demonstrate that caregivers' awareness, educational level, and sociocultural status are directly related to the frequency and severity of domestic accidents. [23, 24] Parents' awareness and personal experiences play a crucial role in the preventive measures they take against household accidents. Additionally, parents act as primary first aid providers in such incidents. As a preventive healthcare strategy, providing regular training to families with children on domestic accidents and first aid practices is essential for improving outcomes and reducing the incidence of such accidents.[25]

In conclusion, the negative effects of the quarantine period during the pandemic on both parents and children cannot be overlooked. Quarantine periods pose increased risks for individuals. Additionally, it has been shown that the awareness and education levels of caregivers are directly related to the severity and outcomes of domestic accidents. Therefore, parents must be more cautious and enhance safety measures at home to protect children from domestic accidents during the pandemic. When examining the relationship between caregivers' awareness levels and the outcomes of incidents, the importance of regular and routine training becomes more

evident. Regular parental training programs at community health centers can help reduce the frequency and improve the outcomes of adverse events.

Ethical Considerations: Ethical approval was obtained from the Ankara City Hospital No. 1 Clinical Research Ethics Committee (Date: 26/05/2021 - No: E1-21-1708).

Conflict of Interest: The authors declare no conflict of interest.

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