

# The Effect of the Covid-19 pandemic on emergency service home service calls due to home accidents in children aged 0-6 in Sakarya, Türkiye?

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## Abstract

### Background and Aim

The contribution of global pandemics to the emergence of home accidents is unknown. The study aims to retrospectively examine the effect of the Covid-19 Pandemic on Emergency Service Home Service Calls Due to Home Accidents in Children aged 0-6.

### Methods

Data are reported in two sections. The descriptive part is a retrospective analysis of patients admitted to Sakarya Training and Research Hospital Pediatric Emergency and Adult Emergency Unit between March 16, 2019 and January 31, 2020 (non-COVID-19era) and March 16, 2020 and January 31, 2021 (COVID-19era). The second part of the study, the comparative part, presents mean data for 2019-2020 (non-COVID-19era) and 2020-2021 (COVID-19era) from the same center and the same period. These data will then be compared.

### Results

A total of 9,110 pediatric patients applied to our center during the study period, of which 7,905 patients were in the non-Covid-19era period and 1,205 patients were in the Covid-19 era. While the rate of hospital admissions decreased by 85% in the Covid-19era compared to the non Covid-19era, when the periods are evaluated within themselves; the forensic report retention rate in the Covid-19era increased by 180% and the rate of hospitalization increased by 75%, The rate of drug overdose increased by 280% and chemical substance use increased by 325% compared to the non-Covid-19era. However The Covid-19 era, the fall rate decreased by 31% and the burn rate decreased by 17% compared to the non-Covid-19 era.

### Conclusions

During the national lockdown period, our pediatric emergency department experienced significantly reduced volumes of children. Despite the decrease in hospital admission rate during the COVID-19 pandemic, there was still a very high increase in poisoning from home accidents. This study can provide a basis for further research on alternative strategies to address the problem of home accidents during the COVID-19 pandemic.

**Key Words:** Covid-19, Pandemic, Emergency care, Children, Home Accidents

## Introduction

In early December 2019, the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was first reported in Wuhan, China, causing the coronavirus disease (COVID-19) to spread worldwide<sup>1</sup>. The World Health Organization declared COVID-19 a Public Health Emergency of International Concern on January 30, 2020 and a pandemic on March 11, 2020<sup>2</sup>. The virus has been proven to be transmitted through human contact, causing a surge in the number of confirmed cases<sup>2</sup>. As of February 8, 2021, the average number of Covid-19 cases in Türkiye is 2,539,559<sup>3</sup>.

Home accidents are among the most common causes of mortality and morbidity in children and constitute a substantial part of admissions to emergency departments<sup>4</sup>. Falls, burns, poisoning, and related complications are common in accidents at or around homes. Although home accidents are seen in all age groups, these are especially

significant problems for children, with increased mortality and morbidity<sup>5</sup>. The protective measures applied for isolation during the Covid-19 pandemic in Türkiye, the closure of schools on March 16, 2020 for an indefinite period, and the curfew imposed for the under-20-year-old group caused the children to remain at home. However, the contribution of global pandemics to the emergence of home accidents is unknown. Limited studies have been conducted on the increase in home accidents in children aged 0-6 in the world during the pandemic<sup>6,7</sup> and decrease<sup>8,9</sup>. This study aims to retrospectively examine the effect of the Covid-19 Pandemic on Emergency Service Home Service Calls Due to Home Accidents in Children aged 0-6 in Sakarya, Türkiye. In this study, it was aimed to reveal how the types and distribution of home accidents in children changed during the pandemic period and the increase/decrease of these rates compared to the pre-pandemic period. The study results will be help

to contribute to taking timely and effective measures by foreseeing possible home accidents, as children may need to stay indoors in the current pandemic and future pandemics or similar situations.

## Methods

This study has a descriptive and a comparative part. The descriptive part is a retrospective analysis of patients admitted to Sakarya Training and Research Hospital Pediatric Emergency and Adult Emergency Unit between March 16, 2019 and January 31, 2020 (non-COVID-19 era) and March 16, 2020 and January 31, 2021 (COVID-19 era). The ethics committee of Sakarya University Faculty of Medicine received permission dated February 8, 2021 and numbered 71522473-050.01.04-15110136. Sakarya Training and Research Hospital is a hospital in Sakarya province in western Türkiye. The pediatric emergency service of the hospital is the tertiary level pediatric emergency service, serving a minimum population of 15,000 monthly and an average of 10,204 pediatric patients in the adult emergency rooms (traumatic cases such as electric shock and cuts).

The second part of the study, the comparative part, presents mean data for 2019-2020 (non-COVID-19 era) and 2020-2021 (COVID-19 era) from the same center and the same period. These data will then be compared. Inclusion criteria for the study were records of children aged 0-6 within the specified date range. Data were taken from the Kardelen Software (KARMED) database. This system includes demographic, clinical, and laboratory results data of all patients who applied to the emergency department.

The home accidents recorded included falls, poisoning, foreign body aspiration, burns, foreign body stinging, and electric shock. Then, researcher obtained the data from the

KARMED database.

Data are presented as means and standard deviations (SD) and percentages. Comparing data from each period is conducted using the independent sample t-test and chi-squared tests. All analyses were conducted using SPSS software version 25.0 (IBM Corporation). We considered these two periods together as a reference, and we used a simple logistic model to provide effect size with odds ratios. P value < 0.05 is considered significant.

## Results

A total of 9,110 pediatric patients applied to our center during the study period, of which 7,905 patients were in the non-Covid-19 era period and 1,205 patients were in the Covid-19 era. Respectively, the mean age was  $2.69 \pm 1.612$  and  $2.52 \pm 1.489$ . The ratio of boys to girls was 1.27 and 1.23, and the place of residence was a province (37%). Demographic characteristics are shown in Table 1.

Some accident types and rates applied to the pediatric emergency department, respectively (non-Covid-19 era / Covid-19 era); falls (68% / 47%), foreign body aspirations (12% / 10%), burns (6% / 5%), drug overdose (5% / 19%), and chemical substance drinking (4% / 17%) (Table 2).

A statistically significant relationship can be seen between the mean age and the eras ( $p < 0.05$ ). This observation indicates that the rate of admission to the pediatric emergency department in the Covid-19 era compared to the non-Covid-19 era decreased by 20% under the age of one year (0-12 months) and 25% in the five age group, while it increased by 20% in the two age groups (Table 1).

A statistically significant relationship was noted between the rate of keeping forensic reports and the eras ( $p < 0.05$ ).

**Table 1: Statistics and Demographic data from the COVID and non-COVID era (n:9110)**

	Non-COVID-19 Era n (%)	COVID-19 Era n (%)	Increase / decrease (+ / -)	P-value	
Mean Age (years)	$2.69 \pm 1.612$	$2.52 \pm 1.489$		0.001*	
Age	<1 age	425(5)a	46(4)b	-20%	<0.001**
	One age	1764(22)a	293(24)a	+9%	
	Two age	1878(25)b	358(30)a	+20%	
	Three age	1366(17)a	203(17)a	-	
	Four age	1128(14)a	153(13)a	-7%	
	Five age	936(12)a	104(9)b	-25%	
	Six age	408(5)a	48(4)a	-20%	
Male-Female ratio	4434/3471	667/538		0.631	
Living place	Village	738(9)a	71(6)b	-33%	<0.001**
	Town	4224(54)b	693(57)a	+5%	
	Province	2943(37)a	441(37)a	-	
<b>Total</b>	<b>7905</b>	<b>1205</b>			

\* Independent sample t test

\*\* chi square

The difference in groups a>b is indicated by the indices a and b.

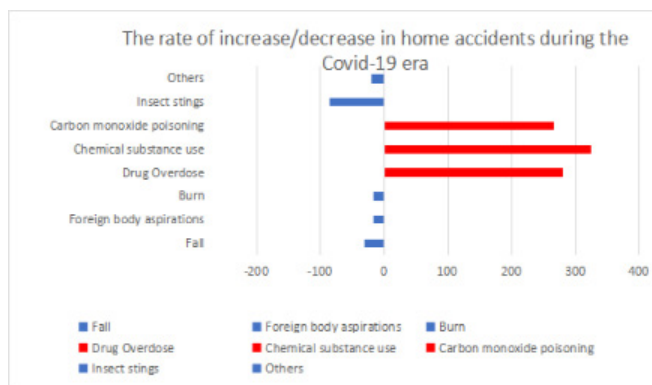
**Table 2. Summary of home accidents admitted from the COVID-19 and non-COVID-19 era (n:9110)**

		Non-COVID-19 Era n (%)	COVID-19 Era n (%)	Increase / decrease (+ / -)	P-value
Forensic report*	Yes	369(5)	171(14)	+180%	<0.001**
	No	7536(95)	1034(86)	-9%	
Final state of the patient after admission	Discharge	7262(92) <sup>a</sup>	1033(86) <sup>b</sup>	-6%	<0.001**
	Hospitalization	643(8) <sup>b</sup>	172(14) <sup>a</sup>	+75%	
<b>Accident types</b>					
Fall		5369(68) <sup>a</sup>	567(47) <sup>b</sup>	-31%	<0.001**
Foreign body aspirations		921(12) <sup>a</sup>	123(10) <sup>a</sup>	-17%	0.214**
Burn		521(6) <sup>a</sup>	57(5) <sup>b</sup>	-17%	0.021**
<b>Poisoning</b>					
	Drug overdose	374(5) <sup>b</sup>	228(19) <sup>a</sup>	+280%	<0.001**
	Chemical substance drinking	317(4) <sup>b</sup>	205(17) <sup>a</sup>	+325%	
	Carbon monoxide poisoning	21(0.3) <sup>b</sup>	13(1.1) <sup>a</sup>	+266%	
	Insect stings	339(4.3) <sup>a</sup>	7(0.6) <sup>b</sup>	-86%	0,564
	Others (Electric shock, foreign body stinging)	43(0.5) <sup>a</sup>	5(0.4) <sup>a</sup>	-20%	
<b>Total</b>		<b>7905</b>	<b>1205</b>	<b>-85%</b>	

\* Poisoning, Burn

\*\* chi square

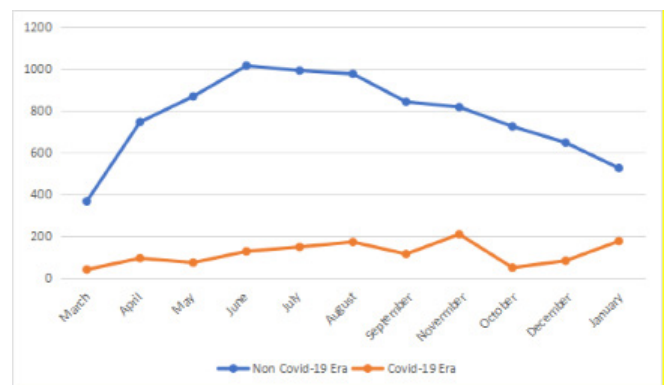
The difference in groups a>b is indicated by the indices a and b.



**Figure 1. The rate of increase/decrease in home accidents during the Covid-19 era**

According to this, the forensic report retention rate in the Covid-19 era increased by 180% compared to the non-Covid-19 era. A statistically significant relationship was observed between the final state of the patient after admission and the eras ( $p < 0.05$ ). After applying to the emergency department, the rate of hospitalization in the Covid-19 era increased by 75% compared to the non-Covid-19 era.

The result of the applied chi-square test revealed a statistically significant relationship between the different periods (non-Covid-19 era / Covid-19 era) and accident types falling, burns, drug overdose, chemical drinking, carbon monoxide poisoning, and insect stings ( $p < 0.05$ ). According to this, in the Covid-19 era, the fall rate decreased by 31%, the burn rate decreased by 17%, and the insect stings rate decreased



**Figure 2. Number of home accidents according to periods and months**

by 86% compared to the non-Covid-19 era. The rate of drug overdose increased by 280%, chemical substance drinking increased by 325%, and carbon monoxide poisoning increased by 266%. Foreign body aspiration decreased by 17% during the Covid-19 era, although not statistically significant ( $p = .214$ ) compared to the non-Covid-19 era (Table 2 and Figure 1).

The distribution of home accidents in the Covid-19 era and in the non-Covid-19 era by month is shown in Figure 2. While home service calls to the emergency departments due to home accidents increased in March-April, May-August, September-October, and November-January during the Covid-19 era, they increased in the March-June period in the non-Covid-19 era.

## Discussion

The findings in this study show a decrease in the number of pediatric patients admitted to the pediatric emergency department during the COVID-19 outbreak, possibly as a result of the change in people's behavior and lifestyle due to social distancing and home quarantine. The closure of educational institutions in Türkiye was implemented in March 2020 with subsequent moving of educational activities to online until an unspecified date were among the first measures taken for covid-19<sup>10</sup>. These restrictions were further expanded after April 4, 2020 with "stay at home" orders and curfews for children under 20 years, which resulted in children spending more time at home. These factors resulted in an approximately 85% reduction in pediatric emergency room visits, as parents were concerned about exposing their children to the COVID-19 Virus when they went to the hospital setting<sup>11</sup>. This resulted in an approximately 85% reduction in pediatric emergency room visits. A similar trend occurred in countries like Ukraine and Argentina (30–80%)<sup>8,9</sup>. Contrary to our study findings, Tuygun et al. (2021), in their study in Türkiye, the rate of applying to the pediatric emergency service due to home accidents increased during the Covid-19 period (1.1%)<sup>12</sup>. However, the main concern is that some children were allegedly being kept at home even though they had very important and serious pathologies requiring urgent medical attention. Nabian et al. (2020) noted that even though pediatric traumas in Iran decreased during the COVID-19 pandemic, this decrease may not be due to absence of accidents<sup>13</sup>. According to Bressan et al. (2020), home accidents have increased significantly (Control period previous year (2019): 5.0 (1.7 to 14.6) IRR (95% CI)  $p = 0.003$ ) during the pandemic compared to the previous year, and they also pose a serious threat to children's health than COVID-19<sup>14</sup>. Another concern is the recognition that most patients presented to the hospital with severe clinical conditions.

In our study, the rate of forensic report keeping and that of hospitalized children differed significantly between the periods examined. In children who were admitted to the emergency department, the forensic report rate increased by 180% and the hospitalization rate by 75%. Liguora et al. (2021) report that hospitalizations in the COVID-19 pandemic increased significantly (3–7.8%) compared to previous periods in Italy<sup>15</sup>, as do similar studies in Israel and ABD<sup>16,17</sup>. In particular, we can confirm a relative increase in the rate of children with severe traumatic injuries during the COVID-19 epidemic as per the forensic reports and the high rate of hospitalization for incoming cases. This may be due to patients with minor disease who reduced their pediatric emergency care visits or avoided visiting altogether, while those with more severe conditions did not.

This study revealed a decrease in pediatric emergency department admissions for children "below 0-12 months/1 year" and 5 years (25%), while the admissions of the two age groups increased overall (20%). Benmassaoud et al. (2020) In the studies they conducted with children in the 0-15 age group in North Africa, no significant difference was found in the incidence of accidents by age group<sup>18</sup>. These results might be attributable to the 2 years old groups, which both consist of toddlers who are in the act of exploring their households, having accidents more often. Some studies have found that childhood accidents are most frequently caused by poor parental observation while children are playing

together<sup>19,20</sup>. The inability of children to play with their peers due to social isolation and the absence of family get-togethers may have thus reduced the rate of home accidents for 5 year pre-school children.

During the COVID-19 pandemic, child hospital admissions at the village level decreased while those at the town levels increased. According to Liguora et al. (2021), one of the reasons for the decrease in pediatric emergency service visits is poor health-seeking behaviors where by parents or caregivers avoid hospitals for fear the risk of COVID-19 transmission in healthcare settings<sup>15</sup>. Büyüksoy et al. (2021), in their study with children aged 6-12 in Türkiye, stated that 92.4% of children did not benefit from health care needs, and 89.9% of this was due to the fear of covid-19 itransmission<sup>21</sup>. It can be thought that parents intervene in their children at home or postpone the intervention in cases of accidents, which they consider less risky, due to the situation of using public transport to go to the hospital, the fear of infecting their children by going to hospitals and the long waiting time in the emergency room.

Home accidents are the leading preventable childhood accidents in Türkiye and the world<sup>22</sup>. They frequently occur in the preschool period and may lead to disabilities or even death. According to the WHO (2014), poisoning, burns, and falls are the most common accidents in children younger than 15 years and form some of the most significant health problems for children<sup>23</sup>. Previous studies report that 18–40% of all accidents in Türkiye are home accidents<sup>24</sup>.

This study<sup>3</sup>, after examining the reasons for hospital admission it is seen that falls (-31%), burns (-17%), insect stings (-86%), foreign body aspiration (-17%) and other types of accidents (-20%) (e.g., electric shock, foreign body stinging) are reduced in children. Mann et al. (2021) found that burns in children aged 2–3 years is less prevalent than other types of accident (45%).<sup>25</sup> Unlike our results; according to Güleriyüz et al. (2021), the incidence of falls, stomach/intestinal foreign bodies, and stab wounds (in Türkiye) were significantly higher during the COVID-19 period among children<sup>26</sup>. Similarly, Liguora et al. (2021) report that ingestion/breathing of foreign bodies and burns were more frequently diagnosed in children who presented to the pediatric emergency department during the pandemic period<sup>15</sup>. Chaiyachati et al. (2020) emphasize that the number of foreign body aspirations was especially high in 2020 compared to previous years<sup>16</sup>. Benmassaoud et al. (2020) In their study with children aged 0-15 in North Africa, they reported that falls were 20.75% and burn accidents were 10.24% more common<sup>18</sup>. Since this study had a retrospective study design, there were limitations in obtaining some information about the reasons for the increase in home accidents in children (for example, family characteristics, working conditions of parents, seasonal differences, or who takes care of the child). We think that there is a need for studies conducted in different patterns that distinguish these reasons.

This study determined that the number of hospitalizations for drug overdoses, carbon monoxide poisoning, and chemical ingestion (especially bleach and non-alcoholic disinfectants) increased dramatically (280%, 266%, and 325%, respectively). Annual data from the National Poison Data System also showed an increase of 16–20% in poisonings in 2020<sup>27</sup>. Le Roux et al. (2020) further indicate an increase in poisoning from household cleaning products and drugs in the preschool

period during the Covid-19 period<sup>28</sup>. In parallel with the current study's findings, research report that chemical and alcohol-based disinfectant poisonings have increased in the United States<sup>29,30</sup>. Among this study's findings, there were also disinfectant poisonings in the chemical poisoning category (n = 2). As of May 31, 2021, American Association of Poison Control Centers poison control centers have managed 10,554 hand sanitizer exposure cases in children 12 years and younger<sup>31</sup>. In line with recommendations from WHO in early March 2020, more frequent use of alcohol-based hand sanitizers and household cleaning supplies to prevent the spread of COVID-19 have likely contributed to the greatly increased exposure to these agents<sup>32</sup>. Additionally, most hand sanitizers are packed in brightly colored bottles and have an attractive smell, such as candy or food, which young children find appealing. This situation poses a great risk of ingestion. Due to the frequent use of hygienic products, these products may be placed in places where children can reach them more easily. In addition, since children in this age group show the ability to imitate their parents, seeing that their parents use these products a lot may have increased their interest and curiosity. These results; while recommending the use of hygiene products, the absence of careful warnings about the dangers that may arise for children may be an indication that this issue is not sufficiently emphasized to raise awareness of families and society. The presence of warnings about possible harm to children on chemical substances can reduce these problems.

Admissions to the emergency department due to home accidents during the COVID-19 era also varied by month. This study determined that the number of admissions to pediatric emergency services increased in March-April, May-August, September-October, and November-January. Erlichment et al. (2020) similarly report that emergency service admissions increased in May-July 2020<sup>16</sup>. With Turkey's suspension of in-school education in March 2020 came curfew restrictions. Partial freedom was granted in May, June, and August 2020 that let children go out at certain times, and they started to go to gyms and parks. As of November 17, children under the age of 20 years were placed in home lockdown again with the reimposition of a curfew<sup>33</sup>. It is notable that the number of hospital admissions increased in parallel with the curfews at the peak of the pandemic.

Our study has several limitations. It was a single-center retrospective analysis, and therefore the generalizability of these findings may be limited to comparable institutions. Moreover, we could not evaluate the possible role of factors influencing people's perceptions and utilization of healthcare facilities, such as family structure and socioeconomic status, scholarship, part of the house where the accident occurred. However, despite the retrospective design, data were collected prospectively in a standardized way, with detailed clinical and epidemiological information for each patient from hospital software.

## Conclusion

In conclusion, during the national lockdown period, our pediatric ED experienced significantly reduced volumes of children. This decrease in the number of visits may be due to the fear of the potential nosocomial transmission of SARS-CoV-2 infection. Despite the decrease in hospital admission rate during the COVID-19 pandemic, there was still a very high increase in poisoning from home accidents. The resulting admission of these serious cases to hospitals during

the pandemic led to parallel increases in forensic reports and hospitalization rates. This study can provide a basis for further research on alternative strategies to address the problem of home accidents during the COVID-19 pandemic and alleviate related hospital referrals.

## Patients' Consent

In this retrospective study, the data were collected from the KARMED database after the approval of the Ethics Committee.

## Conflict of Interest

The authors declared no conflict of interest.

## Authors' Contribution

ÖKS: Data collection, statistical analysis, software, data improvement, original draft writing, review writing and editing, final approval. PT: Data collection, software, data improvement, review writing and editing, final approval. BE: Verification, critical revision, final approval. NC: Verification, critical revision, final approval.

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