

A Research of Emergency Service Admission Due To Home Accidents Before and During The Covid-19 (Sars-Cov-2) Pandemic In Ankara (Turkey)

Yavuz Hekimoğlu^{1*}, Burak Taştekin¹, Gülhan Kurtoğlu Çelik², Ahmet Emre Ay², Mahmut Aşirdizer³

¹Clinic of Forensic Medicine, Republic of Turkey Ministry of Health, Ankara City Hospital, Ankara, Turkey

²Department of Emergency Medicine, Faculty of Medicine, Ankara Yıldırım Beyazıt University, Ankara, Turkey

³Department of Forensic Medicine, Faculty of Medicine, Bahçeşehir University, Istanbul, Turkey

ABSTRACT

Home accidents can cause serious injuries, disabilities, and deaths. Approximately 40 million people were treated in hospitals annually because of injuries occurring in homes, and these injuries were responsible for approximately 76% of preventable deaths. The aims of this study are to compare the home accidents in the one-year period during the pandemic and the home accidents in the one-year period before the pandemic, and to reveal how the home accidents are affected in which part of the home and in which types of injuries.

A retrospective study was made of the records of patients injured in home accidents between pre-pandemic and pandemic one-year periods. The patients were classified according to age groups, gender, season, day and time of the home accident, accident type, part of the home, trauma localization and type, and severity of injuries.

While 46.5% of the 581 injured patients were before the pandemic, 53.5% were in the pandemic period. The injuries increased as the number of households staying at home increased compared to the pre-pandemic period. Likewise, there was a significant increase in the number of falls from balconies and windows during the pandemic period.

It is still not possible to make a definite prediction about the course of the pandemic. In this context, it is of great importance to provide information on prevention from home accidents, especially in television programs and distance education activities.

Keywords: COVID-19, pandemic, home accidents, fall, balconies

Introduction

Home accidents, which can cause serious injuries, disabilities, and deaths and are an important health expense for countries, are a public health problem that requires more attention, both nationally and internationally (1-3). The home was defined as the place where the injury occurred the most in a study conducted in the United States in 1997 (4). In another study conducted in the United States between 1997 and 2007, it was stated that home accidents remained the leading cause of injury and the home was the most important place where the injury occurred (5).

It was stated that in 2019, approximately 40 million people were treated in hospitals due to injuries occurring in homes and communities, these injuries were responsible for approximately

76% of preventable deaths and the annual incidence was determined as 40.03 per 100,000 (6).

It was reported that during the COVID-19 quarantine, emergency room visits for children decreased (7-9). Despite that, it was conducted several surveys within the framework of the hypothesis that “spending more time at home due to restrictions may increase the number of home injuries” during the COVID-19 pandemic. It was stated that in these studies, families with children had a higher risk of injury or ingestion at home during this period (10-12). It has also been reported that more fractures, especially hip, and wrist fractures, occur with the increase of home accidents due to excessive in the time spent at home and sedentary life during the COVID-19 pandemic (13,14). However, there is no detailed

*Corresponding Author: Yavuz Hekimoğlu, MD, Assoc. Prof. of Forensic Medicine. Clinic of Forensic Medicine, Republic of Turkey Ministry of Health Ankara City Hospital, Ankara, Turkey
E-mail: evisim@gmail.com, Phone: +90 (505) 648 19 98

ORCID ID: Yavuz Hekimoğlu: 0000-0001-9990-6045, Burak Taştekin: 0000-0002-8617-1059, Gülhan Kurtoğlu Çelik: 0000-0003-1259-3694, Ahmet Emre Ay: 0000-0002-3225-9899, Mahmut Aşirdizer: 0000-0001-7596-5892

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study in the literature examining the situation of home accidents before and during the pandemic.

The aims of this study are 1) to compare the home accidents in the one-year period during the COVID 19 Pandemic (between March 12, 2020, and March 11, 2021) and the home accidents in the one-year period before the COVID 19 Pandemic (between March 12, 2019, and March 11, 2020), and 2) to reveal how the home accidents are affected in which part of the home and in which types of injuries in Ankara-Turkey example.

Material and Methods

Ankara is the capital and second-largest city of Turkey with a population of 5,663,322 (2020). Ankara City Hospital has a total of 3,810 patient bed capacity.

In this study, the records belong to Paediatric and Adult Emergency Departments of Ankara City Hospital of patients injured in home accidents between March 12, 2019, and March 11, 2021 were retrospectively reviewed appropriately to the aims of the study. The first coronavirus case in Turkey was detected on March 11, 2020, and the Presidential Cabinet defined the first restrictions against the Pandemic on March 12, 2020, activities were stopped in various business lines, and the first lockdown period began to be implemented on March 22, 2020. In the following period, the time spent by households at home increased with the increase of working from home and distance education and partial or full lockdown precautions. The periods were named as “Before Covid-19 Pandemic (Pre-CP)” and “During Covid-19 Pandemic (During CP)”.

The patients injured in home accidents were classified according to age groups, gender, season, day and time of the home accident, accident type, part of the home, trauma localization and type, and severity of injuries.

Intentional injuries such as suicide attempts, attacks, abuse of children, women, and elders occurred at home were not included in the study, only cases defined as accidents in forensic case report forms were evaluated.

Statistical Analysis: Data obtained in the study were analyzed statistically using SPSS vn 25.0 software. Descriptive statistics were presented as mean and standard deviation values for continuous variables (characteristics) and as numbers and percentages for categorical variables.

The qui-square test was used for comparisons. The level of statistical significance was set as 5%.

Ethics Approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. The study was approved by the Presidency of Clinical Research Ethics Committee (No:2) of Ankara City Hospital of Ministry of Health, with the 20.09.2021 date, E2-21-831 Decision Number.

Results

A total of 581 patients admitted to Ankara City Hospital due to home accidents. The rate of injury due to home accidents increased by 15.2% during CP. Of the cases, 50.9% were males in total, 53.0% were male in the pre-CP, and 50.8% were female during CP ($p>0.05$). The mean age of patients injured in home accidents in total was 21.4 ± 23.0 years (min: 0, max: 93; median: 10). In both periods and in total, most patients were 4 years old and under and more than half of home accidents occurred under the age of 14 ($p<0.001$) (Table-1).

Most of the accidents were related to falls from height or same level, or stairs in total ($n=273$; 47%) and pre-CP ($n=104$; 38.5%) and during CP ($n=169$; 54.3%) ($p<0.001$). During CP, an increase (62.5%) in the number of falls ($p<0.001$) and a decrease in the number of poisonings (32.7%) ($p<0.05$) were observed. The number of falls from balconies and windows, which was 30 before the pandemic, increased by 186.7% and reached 86 during the pandemic period, which was reflected in the rate increase in falls. Likewise, the decrease in the number of poisonings with substances such as mercury, thinner, and bleach, which was 44 in the pre-pandemic period, to 30 with a 31.8% decrease in the pandemic period was reflected in the numerical decrease in poisonings. Most of accidents occurred in the home sections separated as kitchen and dining room ($n=145$; 25%), followed by living room ($n=125$; 21.5%) ($p<0.001$). During CP, the increase in the number of home accidents in the balconies (341.7%) and windows (83.3%) was remarkable ($p<0.001$ and $p<0.05$, respectively) (Table-2).

Percent 38.6 ($n=224$) of the home accidents occurred in winter ($p<0.001$). Most patients injured in winter months in both pre-CP ($n=108$; 40.0%) and during CP ($n=116$; 37.3%) ($p<0.001$). In the spring season, an increase of 72.5% was

Table 1: The Gender, Age Groups of Patients Injured Due To Home Accidents, Before and During The Pandemic

Age Groups (Years)	Home Accidents Before the Pandemic			Home Accidents During the Pandemic			All Home Accidents			Rate of Change in Total	P Value*
	M (n=143)	F (n=127)	Total (n=270)	M (n=153)	F (n=158)	Total (n=311)	M (n=296)	F (n=285)	Total (n=581)		
≤ 4	43	44	87	52	54	106	95	98	193	+21.8	.171
5-14	35	24	59	34	31	65	69	55	124	+10.2	.590
15-24	17	16	33	13	24	37	30	40	70	+12.1	.633
25-44	22	18	40	23	23	46	45	41	86	+15.0	.518
45-64	17	15	32	22	15	37	39	30	69	+15.6	.547
≥65	9	10	19	9	11	20	18	21	39	+5.3	.873
P Value**	.000			.000			.000				

M:Males; F: Females

(*)This P value is the statistical expression of the change in each row before and during the pandemic

(**)This P value is the statistical expression of the distribution of the parameters in each column

observed in during CP ($p < 0.001$). The highest number of home accidents occurred in December ($p < 0.001$). During CP, an increase was observed in April and May ($p < 0.05$). Most home accidents occurred on Thursdays in total ($n=97$; 16.7%) and pre-CP ($n=43$; 15.9%) on Sundays during CP ($n=58$; 16.7%) ($p > 0.05$). During CP, in the number of home accidents, there was a 61.1% increase on Sundays ($p < 0.05$). Home accidents were concentrated between 12.00 and 21.00, most of the home accidents occurred between 15.01-18.00 pre-CP ($n=56$; 20.7%) and total ($n=117$; 20.1%), and between 18.01-21.00 during CP ($n=64$; 20.6%) ($p < 0.001$) (Table-3).

In 172 cases (29.6%), systemic effects were observed due to intoxications and asphyxia. Except those, the most injuries were in the upper limbs in total ($n=135$; 33%), pre-CP ($n=60$; 36.6%) and during CP ($n=75$; 30.6%) ($p < 0.001$). There was an increase in injuries in all body localizations during CP ($p > 0.05$ for limb injuries, $p < 0.05$ for other body regions) (Table-4).

Only soft tissue traumas were described in most home accidents in total ($n=243$; 59.4%), pre-CP ($n=117$; 71.3%) and during CP ($n=126$; 51.4%) ($p < 0.001$). An increase was observed in all wound types during CP and increases in bone fractures and/or visceral injuries (153.2%) were remarkable ($p < 0.05$) (Table-5).

Most injuries were of mild type requiring outpatient treatment or hourly hospitalization ($n=188$; 69.6% for pre-CP, $n=150$; 48.2% for

during CP, $n=238$; 58.2% in total) ($p < 0.001$). During CP, the mild injuries decreased (25.3%) ($p < 0.05$), while the number of moderate injuries requiring 1-3 days of hospitalization (128.6%, $p < 0.001$) and serious injuries requiring more than 3 days of hospitalization/major surgery increased (35%, $p > 0.05$) (Table-6).

Discussion

The rate of injury due to home accidents presented at Ankara City Hospital in a year during CP increased by 15.2% compared to a year pre-CP. Since the official opening date of Ankara City Hospital was March 14, 2019, the rate of increase in home accidents could not be reached in previous years. The number of injured patients who admitted to the emergency departments while 5194 was in the one-year period pre-CP, 4979 was in the one-year period during CP. Thus, the number of patients with other injuries decreased (4.1%). Guleryuz et al. stated that injuries due to home accidents increased during the pandemic, while 9.5% of all cases admitted to the Paediatric Emergency Service in 2019 were due to home accidents, this rate increased to 24.4% in 2020 (15). Regarding the rates of injuries in home accidents, Dizdar et al. reported that females were injured more frequently, ranging from 52% to 75.9% in some previous studies, and males, ranging from 53.3% to 66% in some studies (2). In our series, there were male dominance in the total ($n=296$; 50.9% males) and pre-CP ($n=143$;

Table 2: The Accident Types and Place of Injury of Patients Injured Due To Home Accidents. Before and During The Pandemic

Accident Types	Home Accidents Before the Pandemic		Home Accidents During the Pandemic		All Home Accidents			
	n (270)	%	n (311)	%	n (581)	%	Rate of Change	P Value*
Falls from height or at the same level. or stairs	104	38.5	169	54.3	273	47.0	+62.5	.000
Poisonings	101	37.4	68	21.9	169	29.0	-32.7	.011
Injuries by Cutting/Piercing Tools	21	7.8	30	9.6	51	8.8	+42.9	.208
Injuries by burn, scalding, electrocution and explosion	24	8.9	20	6.4	44	7.6	-16.7	.546
Other Injuries	20	7.4	24	7.7	44	7.6	+20.0	.546
P Value**	.000		.000		.000			
Part of Home								
Kitchen and dining room	71	26.2	74	23.8	145	25.0	+4.2	.803
Living room	67	24.8	58	18.6	125	21.5	-13.4	.421
Bedroom/ kids bedroom	35	13.0	37	11.9	72	12.4	+5.7	.814
Balcony***	12	4.4	53	17.0	65	11.2	+341.7	.000
Windows***	18	6.7	33	10.6	51	8.8	+83.3	.036
Bathroom	24	8.9	23	7.4	47	8.1	-4.2	.884
Entrance, doorway, hallways, stairs or steps	20	7.4	14	4.5	34	5.9	-30.0	.303
Immediate vicinity of home	23	8.5	19	6.1	42	7.2	-17.4	.537
P Value**	.000		.000		.000			

(*)This P value is the statistical expression of the change in each row before and during the pandemic

(**)This P value is the statistical expression of the distribution of the parameters in each column

(***)In the cases defined as falling from the balcony and windows. It was not defined house part which they belong

53% males). An unexplained increase in the number of female cases was detected during CP, and the number of female cases slightly exceeded the number of male cases (n=158; 50.8% females) (p>0.05). In previous studies, children under the age of 5 years and people over the age of 65 years were defined in risky groups for home accidents (1-3,15). In the current study, more than half of home accidents occurred under the age of 14, especially in 4 years old and under. During CP, there was not remarkable difference in the distribution of home accidents in age groups.

In many studies conducted in the world and in Turkey, the first cause of injuries due to home accidents has been reported as falling (1,4,5,10,15-18), with a few exceptions (2,3,19). Likewise, falls were the cause of injuries in nearly half of the cases (n=273; 47%) in the current study. During CP, the number of injuries due to falls increased

by 62.5% (p<0.001), and the number of poisonings decreased by 32.7% (p<0.05). This change was largely associated with the 177.4% increase in balcony and window falls and the 31.8% increase in mercury, thinner, and bleach poisoning during the CP period. We think that this reduction was caused by the fact that, during the CP period, more adults who be able to act as a supervisor to ensure that toxic substances are not left within the reach of children were present at home as a result of quarantines and working from home. Injuries from "burning, scalding, electric shock, and explosion" were found to have reduced by -16.7%. However, this reduction, which might have been caused by the same factor, was not determined to be statistically significant (p>0.05).

It was thought that the increase in the demand for balconies and windows, associated with the restriction of people's going out by obeying the

Table 3: The Seasons, Months, Days of Week and Hours of Day When Patients Were Injured Due To Home Accidents Before and During The Pandemic

Seasons	Home Accidents Before the Pandemic		Home Accidents During the Pandemic		All Home Accidents			
	n (270)	%	n (311)	%	n (581)	%	Rate of Change	P Value *
Spring	51	18.9	88	28.3	139	23.9	+72.5	.002
Summer	31	11.5	47	15.1	78	13.4	+51.6	.070
Autumn	80	29.6	60	19.3	140	24.1	-25.0	.091
Winter	108	40.0	116	37.3	224	38.6	+7.4	.593
P Value**	.000		.000		.000			
Months								
January	34	12.6	37	11.9	71	12.2	+8.8	.722
February	30	11.1	35	11.3	65	11.2	+16.7	.535
March	27	10.0	35	11.3	62	10.7	+29.6	.310
April	13	4.8	28	9.0	41	7.1	+115.4	.019
May	11	4.1	25	8.0	36	6.2	+127.3	.020
June	11	4.1	18	5.8	29	5.0	+63.6	.194
July	8	3.0	12	3.9	20	3.4	+50.0	.371
August	12	4.4	17	5.5	29	5.0	+41.7	.353
September	30	11.1	25	8.0	55	9.5	-16.7	.500
October	32	11.9	24	7.7	56	9.6	-25.0	.285
November	18	6.7	11	3.5	29	5.0	-38.9	.194
December	44	16.3	44	14.1	88	15.1	0.0	1.000
P Value**	.000		.000		.000			
Days								
Monday	26	9.6	31	11.9	57	10.8	+19.2	.508
Tuesday	43	15.9	39	12.5	82	14.1	-9.3	.659
Wednesday	41	15.2	47	15.1	88	15.1	+14.6	.522
Thursday	49	18.1	48	15.4	97	16.7	-2.0	.919
Friday	37	13.7	44	14.1	81	13.9	+18.9	.437
Saturday	38	14.1	44	14.1	82	14.1	+15.8	.508
Sunday	36	13.3	58	16.7	94	15.1	+61.1	.023
P Value**	.251		.157		.055			
Hours								
00:01 – 03:00	26	9.6	21	6.8	47	8.1	-19.2	.466
03:01 – 06:00	13	4.8	14	4.5	27	4.6	+7.7	.847
06:01 – 09:00	12	4.4	16	5.1	28	4.8	+33.3	.450
09:01 – 12:00	28	10.4	40	12.9	68	11.7	+42.9	.146
12:01 – 15:00	54	20.0	58	18.6	112	19.3	+7.4	.705
15:01 – 18:00	56	20.7	61	19.6	117	20.1	+8.9	.644
18:01 – 21:00	47	17.4	64	20.6	111	19.1	+36.2	.107
21:01 – 24:00	34	12.6	37	11.9	71	12.2	+8.8	.722
P Value**	.000		.000		.000			

(*) This P value is the statistical expression of the change in each row before and during the pandemic

(**) This P value is the statistical expression of the distribution of the parameters in each column

Table 4: The Body Regions In Patients Injured Due To Home Accidents, Before and During The Pandemic

Body Regions	Home Accidents Before the Pandemic		Home Accidents During the Pandemic		All Home Accidents			
	n (164)	%	n (245)	%	n (409)	%	Rate of Change	P Value*
Upper Limb Injuries	60	36.6	75	30.6	135	33.0	+25.0	.197
Lower Limb Injuries	19	11.6	20	8.2	39	9.5	+5.3	.873
Head, Face, Eyes, and Neck Injuries	42	25.6	72	29.4	114	27.9	+71.4	.005
Chest, Back, and Abdomen Injuries	19	11.6	35	14.3	54	13.2	+84.2	.029
Multiple Region Injuries	24	14.6	43	17.6	67	16.4	+79.2	.020
P Value**	.000		.000		.000			

(*)This P value is the statistical expression of the change in each row before and during the pandemic

(**)This P value is the statistical expression of the distribution of the parameters in each column

Table 5: The Lesion Types of Injury In Patients Injured Due To Home Accidents, Before and During The Pandemic

Lesion Types	Home Accidents Before the Pandemic		Home Accidents During the Pandemic		All Home Accidents			
	n (164)	%	n (245)	%	n (409)	%	Rate of Change	P Value*
Only Soft Tissue Injuries	117	71.3	126	51.4	243	59.4	+7.7	.564
Fractures	20	12.2	43	17.6	63	15.4	+115.0	.004
Visceral Injuries	7	4.3	37	15.1	44	10.8	+428.6	.000
Visceral Injuries + Fractures	20	12.2	39	15.9	59	14.4	+95.0	.013
P Value**	.000		.000		.000			

(*)This P value is the statistical expression of the change in each row before and during the pandemic

(**)This P value is the statistical expression of the distribution of the parameters in each column

“stay at home” calls during CP, was a factor that increases the falls from balconies and windows. During CP, balcony-related home accidents increased by 341.7% ($p < 0.001$), and window-related home accidents increased by 83.3% ($p < 0.05$). Most home accidents occurred in the kitchen/dining room ($n=145$; 25%) and living room ($n=125$; 21.5%). In previous studies, it was defined that most home accidents occurred in kitchen (16,18,20), and the living room (2,17,20,21).

Percent 38.6 ($n=224$) of the home accidents occurred in winter. Likewise, winter has been defined as the season in which home accidents occur most frequently in many previous studies

(2,16,19,22), but some studies indicated that the frequency of home accidents increased in summer (17,18). Dizdar et al. stated that this difference may be related to the climate of the region where the accidents are located. In cold climates, more carbon monoxide poisonings occur due to more use of heaters such as stoves and more falls due to ice on the roads in winter whilst in hot climates more falls from height occur due to more people go to balconies and windows in summer (2). In the current study, it was observed that during CP, injuries due to home accidents increased by 72.5% in the spring ($p < 0.001$). Similarly, during CP the number of cases increased by 115.4% in April ($p < 0.05$), and by 127.3% in May ($p < 0.05$). This

Table 6: The Severities of Injury In Patients Injured Due To Home Accidents, Before and During The Pandemic

Severity of Injuries	Home Accidents Before the Pandemic		Home Accidents During the Pandemic		All Home Accidents			
	n (270)	%	n (311)	%	n (581)	%	Rate of Change	P Value*
Mild	188	69.6	150	48.2	338	58.2	-20.2	.039
Moderate	56	20.7	128	41.2	184	31.7	+128.6	.000
Serious	20	7.4	27	8.7	47	8.1	+35.0	.307
Death	6	2.2	6	1.9	12	2.1	0.0	1.000
P Value**	.000		.000		.000			

(*)This P value is the statistical expression of the change in each row before and during the pandemic

(**)This P value is the statistical expression of the distribution of the parameters in each column

increase coincides with the period when strict “stay at home” measures were implemented, especially at the beginning of the pandemic. Monday (20,23), Wednesday (24), Thursday (25), and weekend (20) were defined as the days with the highest number of home accidents in different literature. In present study, home accidents were concentrated on Thursday in pre-CP period (n=43;15.9%; p>0.05), on Sunday during CP (n=58; 16.7%; p>0.05) by 61.1% increasing (p<0.05). The increase on Sundays was thought to be related to the curfews applied from time to time during the period from the beginning of the pandemic to July 1, 2021. Most of the cases occurred in the morning hours (06:00-12:00), daytime hours (08:00-16:00), afternoon hours (12:00-18:00), and evening hours (16:00-24:00) in different literature (2,17,20,21). The period in which home accidents occurred the most was between 12.01 and 21.00 in the current study (58.1% pre-CP, 58.8% during CP, and 58.5% in total; p<0.001) when the household was standing and active. When seasonal, monthly, daily, and temporal changes were evaluated together, it was seen that the number of people injured in home accidents increased as the number of households staying at home increased compared to the pre-CP. Considering that most of those injured in home accidents are children and the elderly, who need more supervision. On the other hand, it is considered as an interesting contrast that the number of home accidents increases as the number of people who can do the supervisory duty increases.

Most injuries in both periods occurred in the upper limbs (p<0.001) and most of them were soft tissue trauma (p<0.001), harmoniously with the information previously described in the

literature (2,17,18,20). In this study, a 20.2% decrease in mild wounds (p<0.05) and a 128.6% increase in moderate injuries (p<0.001) during CP showed that the patients admitted to the hospital in during CP were require more serious treatment. The decrease in applications to emergency departments due to the fear of getting sick during the pandemic period was an indication that many minor injuries were treated by patients without going to the hospital (7-9). Considering the number of injuries related to home accidents that did not go to the hospital during the pandemic period, it is estimated that the number of injuries due to home accidents is much higher than the stated number.

Limitation of This Study: The study was conducted in a single center.

In the present study, it was determined that there was an increase in injuries due to home accidents, while there were decreases in other emergency service admissions. It has been determined that most of the injuries occur in children and the elderly who need supervision; It was found interesting that most of the injuries coincided with stay-at-home periods when more people were at home, that is, the probability of surveillance increased. This warns us that more attention is needed, not more eyes.

Previous researchers have suggested that home accidents, especially children, may affect children more than the COVID-19 outbreak if adequate education is not provided during “stay at home”. Considering that there is an increase in injuries, especially more serious, due to home accidents in the present study, this hypothesis is justified.

It is still not possible to make a definite prediction about the course of the pandemic. In this context, it is of great importance to provide information

on prevention from home accidents, especially in television programs and distance education activities.

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