Childhood accidents before and during the COVID-19 pandemic: a descriptive study

Acidentes na infância antes e durante a pandemia da COVID-19: estudo descritivo

Accidentes en la infancia antes y durante la pandemia de COVID-19: estudio descriptivo

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Abstract

Objective: To compare the characteristics of accidents involving children and adolescents during the COVID-19 pandemic with the characteristics of accidents occurring in the same period of the previous year.

Methods: A descriptive, exploratory, retrospective, cross-sectional study was conducted in the emergency care units of a university hospital in São Paulo. The intentional non-probabilistic sample was obtained from data recorded in electronic medical records and consisted of children and adolescents aged zero to 18 years who were treated for accidents in two study periods: March to September 2020 and March to September 2019. A total of 1,527 children and adolescents treated in 2019 and 1,168 in 2020 were included, and variables characterizing the participants, injuries and care provided were assessed. Data were analyzed using descriptive and inferential statistics, and the Chi-square and Fisher's exact tests were applied.

Results: Accidents accounted for 8% (n=1,540) of the 19,332 pediatric emergency care visits in 2019 and 17.7% (n=1,200) of the 6,784 visits in 2020, with a significant difference in incidence between the years investigated (p<0.001). Foreign body accidents (43% in 2019; 49.6% in 2020) and falls (29.9% in 2019; 21.5% in 2020) prevailed. Most injuries were classified as moderate.

Conclusion: The need for children and adolescents to remain at home during the COVID-19 pandemic resulted in a significant increase in the frequency of accidents in the emergency department, reinforcing the need for actions to promote safe environments for this population.

Resumo

Objetivo: Comparar as características de acidentes ocorridos com crianças e adolescentes durante a pandemia da COVID-19 com as características de acidentes ocorridos no período equivalente do ano anterior.

Métodos: Estudo descritivo e exploratório, retrospectivo e transversal, realizado nas unidades de atendimento de emergência de um hospital universitário de São Paulo. A amostra intencional não probabilística obtida a partir de dados registrados em prontuário eletrônico foi constituída por crianças e adolescentes de zero a 18 anos incompletos atendidas por ocorrência de acidente em dois períodos de estudo: de março a setembro de 2020 e março a setembro de 2019. Foram incluídas 1527 crianças e adolescentes atendidos em 2019 e 1168 em 2020, sendo avaliadas variáveis de caracterização dos participantes, das lesões e dos atendimentos. Os dados foram analisados mediante estatística descritiva e inferencial, sendo aplicado os testes Qui-quadrado e Exato de Fischer.

Resultados: Os acidentes corresponderam a 8% (n=1540) dos 19.332 atendimentos pediátricos de emergência em 2019 e a 17,7% (n=1200) dos 6.784 atendimentos de 2020, havendo diferença significante

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da incidência entre os anos investigados (p<0,001). Prevaleceram os acidentes com corpos estranhos (43% em 2019; 49,6% em 2020) e as quedas (29,9% em 2019; 21,5% em 2020). A maior parte das lesões foi classificada como moderada.

Conclusão: A necessidade de permanência das crianças e adolescentes no ambiente domiciliar durante a pandemia da COVID-19 resultou em aumento representativo da frequência de atendimentos por acidentes no serviço de emergência, reforçando a necessidade de ações para a promoção de ambientes seguros para essa população.

Resumen

Objetivo: Comparar las características de los accidentes ocurridos con niños, niñas y adolescentes durante la pandemia de COVID-19 con las características de los accidentes ocurridos en el período equivalente del año anterior.

Métodos: Estudio descriptivo y exploratorio, retrospectivo y transversal, realizado en las unidades de atención de emergencia de un hospital universitario de São Paulo. El muestreo intencional no probabilístico obtenido a partir de datos registrados en historias clínicas electrónicas estuvo compuesto por niños, niñas y adolescentes de 0 a 18 años incompletos, atendidos por casos de accidente en dos períodos de estudio: de marzo a septiembre de 2020 y de marzo a septiembre de 2019. Se incluyeron 1527 niños, niñas y adolescentes atendidos en 2019 y 1168 en 2020, y se evaluaron variables de caracterización de los participantes, de las lesiones y de la asistencia. Los datos fueron analizados por medio de estadística descriptiva e inferencial y se aplicó la prueba ji cuadrado y la prueba exacta de Fisher.

Resultados: Los accidentes correspondieron al 8 % (n=1540) de los 19.332 casos pediátricos de emergencia atendidos en 2019 y al 17,7 % (n=1200) de los 6.784 casos atendidos de 2020, con una diferencia significativa de la incidencia entre los años estudiados (p<0,001). Prevalecieron los accidentes con cuerpos extraños (43 % en 2019; 49,6 % en 2020) y las caídas (29,9 % en 2019; 21,5 % en 2020). La mayor parte de las lesiones fue clasificada como moderada.

Conclusión: La necesidad de permanencia de niños, niñas y adolescentes en el ambiente domiciliario durante la pandemia de COVID-19 tuvo como resultado un aumento representativo de la frecuencia de casos de accidentes atendidos en el servicio de emergencia, lo que refuerza la necesidad de acciones para promover ambientes seguros para estas personas.

Introduction

Childhood accidents represent a significant public health problem worldwide and are the main cause of death and disability in children and adolescents. According to the World Health Organization (WHO), 950,000 child deaths occur each year worldwide due to violence and accidents. Accidents, also known as unintentional injuries, account for 90% of these deaths.[1,2]

In addition to deaths, tens of millions of children require hospital care for the treatment of non-fatal injuries, and many of them suffer lifelong consequences, such as physical limitations, chronic pain, and post-traumatic stress, as well as implications that affect the family, including financial losses and time off work for parents/caregivers.[1,2]

It is estimated that in Brazil, more than 3,300 children die and 112,000 are hospitalized in serious condition each year due to accidents. Traffic accidents, drowning and suffocation are the main causes of mortality in the country, while falls, burns, poisoning and accidents with firearms are the main reasons for hospitalization.[3]

After the declaration of a pandemic by the WHO in March 2020 due to human infection by SARS-CoV-2, social distancing measures were implemented by health and government institutions with the aim to restrict the agglomeration of people and control the transmission of the virus, which included the closure of daycare centers and schools.[4-7]

In Brazil, school and recreational activities were suspended in March 2020, resulting in a long period of restriction of children to the home environment.[8] While the pandemic was still in effect, educational institutions were gradually reopened from September of the same year, but still with restrictions.

According to the United Nations Educational, Scientific and Cultural Organization - UNESCO, the COVID-19 pandemic has affected millions of children and young people in almost every country in the world, with several risks to their education, protection and health.[9-10] By recognizing their greater vulnerability to accidents during this period, as they were predominantly at home and under the supervision of people who sometimes had to reconcile work activities with childcare, it is essential to know the occurrence and characteristics of these events in this specific context.

Knowledge about accidents is essential for identifying the burden of injuries, helping to define priorities for prevention strategies and resource planning according to the local reality. Such information is still limited at the national level.[2,11] In this sense, this study can provide important support for

planning preventive actions, considering that since the COVID-19 pandemic, new forms of work that keep people working remotely part-time or full-time may be adopted by employers in the short and medium term, causing parents, caregivers and children to spend more time together at home.

Thus, the objective of the study was to analyze the occurrence of accidents involving children and adolescents during the COVID-19 pandemic and to compare the characteristics of accidents that occurred during the COVID-19 pandemic with the characteristics of accidents that occurred in the same period of the previous year.

Methods

This is a descriptive, exploratory, retrospective, cross-sectional quantitative study guided by the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) tool, conducted in emergency care units (pediatric emergency room and ophthalmology, otorhinolaryngology, orthopedics, and general surgery specialties) of a university hospital in the city of São Paulo classified as tertiary level of healthcare. During the study period, the institution provided care to referrals and spontaneous demand in the specialties described.

The intentional non-probabilistic sample obtained from data recorded in electronic medical records consisted of children and adolescents aged zero to 18 years who were treated in pediatric and specialty emergency rooms due to accidents in two study periods: between March and September 2020 and between March and September 2019.

The concept of the Ministry of Health was adopted.[11] It defines an accident as "an unintentional and preventable event that causes physical and/or emotional injuries in the home or other social environments, such as work, traffic, school, sports, and leisure".

Therefore, 1,527 children and adolescents treated in 2019 and 1,168 treated in 2020 for the following causes were included: falls, burns, aspiration and suffocation, drowning, poisoning, shock, traffic accidents, being run over, biting, and multiple trauma. Children and adolescents who were victims of violence were not included.

Variables characterizing children and adolescents, injuries, and care were assessed, namely: age, sex, origin, comorbidities, date, period, and location of the accident, date and specialty of care, length of stay of the child, outcome (discharge, death, hospitalization, transfer), type of accident, first aid measures implemented, main injury, and severity of the injury according to the classification proposed by the United Nations Children's Fund[1] (UNICEF).

Data were collected from April 2021 to February 2022 and recorded in an electronic form containing the study variables. Based on an institutional spreadsheet of recording care during the defined periods, a survey of children victims of accidents was carried out and their medical records were accessed to collect information.

Descriptive and correlation analyzes were performed. Categorical variables are presented according to absolute and relative frequencies. Quantitative variables were analyzed according to descriptive statistics using measures of central tendency and variability. Correlation between variables was performed using the Chi-square and Fisher's exact tests. A significance level of 5% was adopted.

The study was approved by the Research Ethics Committee of the Universidade Federal de São Paulo under opinion number 4.680.208 (CAAE 45578020.3.0000.5505). The provisions of Resolution 466/12 of the National Health Council were complied with in all stages of the study.

Results

Accidents accounted for eight percent (n=1540) of the 19,332 children treated in pediatric and specialty emergency units in 2019 and for 17.7% (n=1,200) of the 6,784 treated in 2020. There was a statistically significant difference between the incidence of accidents in the years investigated ($p<0.001$). Table 1 shows the data characterizing children and adolescents and the number of accidents treated in 2019 and 2020.

In both periods, accidents were more prevalent among boys of preschool and school age from

Table 1. Characterization of children and adolescents and accidents treated by period

Characteristics	2019 n(%)	2020 n(%)	p-value*
Age			
Up to 1 year	187(12.1)	42(3.5)	
1 year to ≤4 years	595(38.7)	676(56.3)	<0.0001
5 years to ≤11 years	684(44.5)	449(37.4)	
≥12 years	73(4.7)	33(2.8)	
Sex			
Female	672(43.6)	518(43.2)	0.805
Male	868(56.4)	682(56.8)	
Origin			
São Paulo	1244(80.8)	991(82.6)	0.227
Other Municipality	296(19.2)	209(17.4)	
Comorbidities			
No	1528(99.2)	1196(99.7)	0.128
Yes	12(0.8)	4(0.3)	
Time of the accident			
Early morning	137(8.9)	82(6.8)	<0.001
Morning	276(17.9)	174(14.6)	
Afternoon	482(31.3)	435(36.2)	
Evening	566(36.8)	358(29.8)	
Not provided	79(5.1)	151(12.6)	
Place where the accident occurred			
Place of residence	268(17.4)	731(60.9)	<0.001
Residence of other people	8(0.5)	14(1.2)	
Public road	49(3.2)	47(3.9)	
Park	8(0.5)	5(0.4)	
Daycare/school	-	5(0.4)	
Others	-	4(0.3)	
Not provided	1206(78.3)	394(32.9)	
Date of care			
Same day as the accident	1461(94.9)	984(82)	<0.001
One day after the accident	35(2.3)	112(9.3)	
2 to 5 days after the accident	32(2.1)	64(5.3)	
More than 5 days after the accident	12(0.7)	30(2.5)	
No information	-	10(0.9)	
Specialties			
Pediatric ER	558(36.2)	373(31.1)	
Otorhinolaryngology	639(41.5)	597(49.7)	<0.001
Ophthalmology	119(7.7)	139(11.6)	
Orthopedics	205(13.3)	78(6.5)	
General Surgery	19(1.3)	13(1.1)	
Length of stay			
Less than 24 hours	1502(97.6)	1162(96.8)	0.270
More than 24 hours	38(2.4)	38(3.2)	
Outcome of care			
Discharge	1471(95.5)	1138(94.8)	
Admission	68 (4.4)	61(5.1)	0.703
Transfer	1(0.1)	1(0.1)	
Total	1540(100)	1200(100)	

*Chi-square test

São Paulo and without comorbidities. The average age of the children was 5.14 years (±3.31) in 2019 and 4.46 years (±2.93) in 2020 (Table 1). A predominance of accidents with children in the preschool age group in 2020 is noteworthy, while accidents were more frequent among schoolchildren (p<0.0001) in 2019. There was a statistically significant difference between the years in relation to the period of the accident, place of occurrence and date of care (p<0.001). In 2019, accidents in the evening (36.8%) prevailed and the place of occurrence was rarely described. In 2020, the incidents occurred mainly in the afternoon (36.2%), with emphasis on the child's place of residence (60.9%). Most of the care was provided on the same day as the accident in both periods (Table 1). Regarding care specialties, in both years there were similarities between the highest rates in the otorhinolaryngology units and pediatric emergency room (p<0.001). Almost all children remained in the institution for less than 24 hours and were discharged from hospital (Table 1). In cases where hospitalization occurred, the Pediatric Surgical Unit was the most frequent, accounting for 57.5% of cases in 2019 and 68.9% in 2020. Table 2 shows the distribution of the types of accidents according to the study period.

Table 2. Distribution of the types of accidents according to the study period

Types of accidents	2019 n(%)	2020 n(%)	p-value*
Traffic accident	3(0.2)	1(0.1)	<0.001
Aspiration and suffocation	9(0.6)	27(2.3)	
Being run over	9(0.6)	9(0.8)	
Shock	1(0.06)	-	
Foreign body accident	663(43)	596(49.6)	
Poisoning	9(0.6)	4(0.3)	
Bite	23(1.5)	25(2.1)	
Falls	460(29.9)	258(21.5)	
Burns	18(1,2)	28(2,3)	
Multiple trauma	345(22,4)	252(21)	
Total	1,540(100)	1,200(100)	

*Chi-square test

In both 2019 and 2020, foreign body accidents, falls, and multiple traumas were the most prevalent events (Table 2). Multiple traumas include eye traumas, injuries caused by sharp instruments, crushed limbs, and sprains. In both years, additional analyzes demonstrated a statistically significant association between age group and type of accident (p<0.001). When dividing the variables, in 2019 foreign body accidents were significantly associated with infants (37.1%), preschool (35.2%), and schoolchildren (35.2%), while multiple traumas were associated

with adolescents (45.2%). In 2020, infants were statistically associated with the occurrence of falls (73.8%), and preschool (57.8%) and schoolchildren (42.5%) with foreign body accidents. Among adolescents, this year, the association was with falls (36.4%) and foreign body accidents (33.3%). In both years, there was a statistically significant association between the type of accident and the need for hospitalization (p<0.001). In 2019, the types of accidents that resulted in hospitalizations were traffic accidents, aspiration and suffocation, being run over, shock, poisoning, and multiple traumas. In 2020, children required hospitalization when aspiration and suffocation, foreign body accidents, and bites occurred. In both years, there was no information related to the implementation of first aid measures in almost all cases (n=1,521, 97.9% in 2019) (n=1,152, 93.6% in 2020). When there was a description of the action, we identified application of ice, immobilization, airway clearance maneuver, hemorrhage control, administration of medication, and attempts to remove the foreign body by the person responsible for the child/adolecent. The severity of the injury was assessed according to the classification proposed by UNICEF, with a predominance of 'moderate injuries - need for health service care without hospitalization/admission, injury prevented the child from performing daily activities'. There were no deaths related to accidents (Table 3).

Table 3. Severity of injury caused by accidents according to period

Injury severity	2019 n(%)	2020 n(%)	p-value*
Fatal - immediate or delayed death as a result of the injury caused by the accident.	-	-	<0.001
Severe - caused permanent disability (examples: blindness, deafness, loss of limbs, etc.)	5(0.3)	3(0.2)	
Serious - required hospitalization for 10 days or more and surgery.	45(2.9)	42(3.5)	
Major injury - need for hospitalization for up to 10 days without surgical procedure.	15(1)	6(0.5)	
Moderate injury - need for health service care without hospitalization; injury made it impossible to perform daily activities	1114(72.3)	634(52.9)	
Moderate injury - need for health service care without hospitalization; injury made it impossible to attend school or perform work activities	361(23.5)	277(23.1)	
No information	-	238(19.8)	
Total	1,540(100)	1,200(100)	

* Chi-square test

Discussion

This study presents the characteristics and comparison of accidents involving children and adolescents treated at the emergency department of a university hospital in the city of São Paulo in 2019 and 2020. In addition to the significant proportion of accidents involving children in relation to the total number of visits, especially in 2020, there was a significant increase in the number of accidents during the COVID-19 pandemic compared to the pre-pandemic period.

As described in national and international literature,[1,2,12-16] the results showed that accidents were more prevalent among boys of preschool and school age, and occurred mainly in their own homes, with emphasis on foreign body accident and events involving falls and multiple traumas. The accidents resulted mainly in moderate injuries and had hospital discharge as the main outcome.

Similar to other studies,[13-14,17] the accidents described in this study represent the daily care provided by emergency services, which are characterized by events of lesser severity and complexity. However, even though hospital discharges in less than 24 hours have prevailed, the increase in the number of accidents during the period of social isolation, when school activities were suspended, indicates that although there is extensive scientific knowledge about causes and risks, interventions that promote safety and disseminate prevention strategies are still extremely necessary.

Based on interviews conducted with 64 parents of children under five years of age, it was found that anticipating risks, supervising children, offering education about safety rules, adapting the home environment, and learning from real stories of other families are elements that facilitate accident prevention.[18]

Sex, age, and stage of neuropsychomotor development are among the characteristics frequently associated with accidents in children.[2,12-16] Boys are supposedly more exposed to risk situations, as they engage in activities with greater physical impact, strength, and speed, which favors the occurrence of accidental injuries.[14,17]

Preschool children are in a period of magical thinking and intense improvement in motor and postural coordination, while schoolchildren are going through a period of expanding acquired skills and limited understanding of exposure to risks, factors that also increase the chance of injuries.[2,12,14,15]

As the home presents diverse risk factors that are often unperceived by families, this is often described[14,15] as one of the main places where accidents occur in childhood, and in the present study, this fact may also be related to the long period of time children have spent at home with the closure of schools and daycare centers.

During the pandemic, when changes in the routines of many families were necessary, and work activities were also performed in their respective homes, the lack of continuous supervision of children may have been an additional contributing factor. Inadequate supervision is one of the risk factors described in the literature as an important contributor to the occurrence of accidents. The level of supervision necessary to ensure the safety of the child, in turn, is directly related to the characteristics of parents and family members, including parenting experiences and styles and their perceptions about the occurrence of childhood injuries. Children who suffer accidents are more likely to have parents who engage in activities that promote distraction or enforce fewer safety rules, for example.[19]

The prevalence of falls, foreign body accidents and multiple traumas with edema, lacerations, and cut-and-blunt injuries is also related to specific characteristics of the predominant age groups, highlighting motor immaturity, types of games appropriate for their age, and the tendency to explore the environment and their own body.[12,17,20]

Falls represent significant events given the numerous injuries they can cause. Specifically in relation to foreign body accidents, which were very frequent in the findings of this study, evidence indicates that socioeconomic, cultural, and educational factors are determining factors in the frequency and particularities of occurrences.[17,20] The severity of incidents with foreign bodies is directly related to the type of object, the place where the object was lodged, and the age of the child.[14,17]

First aid measures were rarely described in the medical records analyzed. However, it is important to highlight that parents and guardians sometimes perform actions that are not recommended, such as administering medications without clinical evaluation, which may constitute an additional risk.

Despite the low severity, the frequency (17.7%) of accidents during the pandemic period analyzed was significant. A similar study conducted in a reference service in the state of São Paulo in 2017 identified that accidents in childhood accounted for 12.1% of care services.[17] Considering that the study presents data from a single health service with flaws in the records, mainly due to the lack of information, the results indicate that the risks of accidents with children remain and are even greater when schools and daycare centers are closed.

Evidence on the subject is scarce, especially at the national level, ranging from descriptive data on incidence, risk factors and repercussions, to the identification and implementation of strategies to prevent the occurrence of events. Considering the current context of clinical practice of researchers, the setting for this study, it is urgent to outline and implement actions that contemplate the prevention of accidents involving children. Regarding the role of nurses, it is essential to offer investigation and guidance to children and families in all care opportunities at the various levels of care.

The lack of detailed information in the medical records and the sample from a single service represent limitations of the study. At the same time, the study brings contributions related to the case study of the theme, reinforces the essential role of daycare centers and schools in the safety and protection of children, and highlights relevant points to be addressed in prevention strategies.

Conclusion

There was a significant increase in the frequency of care due to accidents involving children during the COVID-19 pandemic, with a predominance of males, preschoolers and schoolchildren, and events occurring in home environments. Most accidents

were classified as moderate, without the need for hospitalization, with a length of stay of less than 24 hours and hospital discharge was the main outcome.

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Collaborations

Bastos FAG, Barbosa MF, Silva L, Oura KHU, Kusahara DM and Belela-Anacleto ASC contributed to the study design, analysis and interpretation of data, writing of the article, relevant critical review of the intellectual content and approval of the final version to be published.

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