

A Secondary Data Analysis of Trapped and Forgotten Children in Parked Vehicles among Malaysians

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ABSTRACT – *Each year, numerous children die from heatstroke and hyperthermia after being left unattended in parked vehicles. This descriptive study examines the prevalence and characteristics of such incidents in Malaysia. Secondary data were collected from local news reports and relevant government agencies, followed by a structured interview with an authority officer to validate the findings. Analysis of the data revealed that between 2012 and 2024, 17 children in Malaysia died after being left alone in vehicles, with heatstroke identified as the primary cause of death. According to the Fire and Rescue Department Malaysia, 2,520 cases of children trapped in vehicles were reported from 2012 to 2022, resulting in eight injuries and four fatalities. The interview indicated that many of these cases were not due to caregiver negligence or forgetfulness, but rather attributed to system errors, such as malfunctioning vehicle locking mechanisms. Additionally, only eight police reports were filed by caregivers or concerned individuals over the same period, suggesting significant underreporting. This study highlights the urgent need for increased public awareness, preventive strategies, and policy interventions to reduce the risk of child fatalities in parked vehicles.*

KEYWORDS: Forgotten baby syndrome, prevalence, children, heatstroke

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1. INTRODUCTION

The event of parents and caregivers forgetting children in a parked vehicle has become a significant concern worldwide due to the tragic event of children dying due to the event. In 2023, there were three cases of parents forgetting their children in parked vehicles, which led to death in Malaysia. Heatstroke is found to be the main reason for death among children left in a parked vehicle. The action of forgetting a child in a locked vehicle is called forgotten baby syndrome. This syndrome may occur in any healthy adult mind due to stress-induced situations or when facing a new routine activity compared to previous days of their life. As a result, they become more attentive to the current problem rather than a distant memory of leaving their child in a vehicle (Jawi, 2018). The number of children forgotten in parked vehicles among Malaysians has raised a significant concern due to the event's recurrence. The problem worsens when the victim is found dead. Based on the cases reported in the news, heatstroke is found to be the main reason for death.

Children are more prone to death due to heatstroke as compared to adults because of their susceptibility. Two factors differentiated between children and adults that increase children's susceptibility to the death of heatstroke: physiology and behavior. In terms of physiological aspects, children gain heat faster from the environment when compared with adults. This is because the thermoregulation of children is not mature enough to protect them from overheating (Ismail et al., 2019). The activity of the skin and sweating are insufficient to cool down the body temperature in children (Ferrara et al., 2013). The circumstances worsen when left in a locked vehicle, as the temperature may rise by 16°C within a few minutes. Children are known for not being able to recognize the dangerous situations they are in. Thus, they depend on their caregiver to acknowledge the heat impacts and to

take necessary actions to get themselves out of a hazardous situation. A study conducted by Alowirdi et al. (2020) concluded that awareness programs for parents and caregivers are strongly encouraged to reduce the prevalence of parents and caregivers leaving children unattended in enclosed vehicles. In their study it was reported that 24.88% have left at least one of their children unattended inside locked cars during a sunny day; 78.85% of parents have heard about accidental deaths secondary to leaving children in locked vehicles and 81.34% of them knew the correct information regarding sensitivity to heat in infants and children.

Children have a higher chance of becoming victims of heatstroke because they are more susceptible to a failed thermoregulatory system in the body. The function of thermoregulation in the human body is to maintain a relatively constant core body temperature at 37 degrees Celsius (Tansey & Johnson, 2015). The reason for a failed thermoregulation system is that when there is a severe increase in body temperature, which is above 40 degrees Celsius, with central nervous system dysfunction that may lead to delirium, seizures, coma, and, worst of all, death. It usually occurs when an individual is exposed to a high-temperature environment, for example, trapped in a locked vehicle under the sun (William, 2017). The danger of heatstroke can be seen in the many reported cases, as it only took two hours, the shortest amount of duration, resulting in death among the victims. Heatstroke is the most severe type of heat-related illness that can happen to any individual (Mangus & Canares, 2019). This paper aims to report the prevalence of forgetting children in parked vehicles among Malaysians.

2. METHODS

This study utilized secondary data obtained from various sources. The following explains the details. News reports regarding the case of parents forgetting their children in parked vehicles among Malaysians were searched online. The news obtained provides details of the incident, including the victims, caregivers, circumstances, and consequences. The keywords used to search for the information were "child death in a car", "left child in a car", "left a baby in a car", "child heatstroke in a vehicle", and other keywords with a similar theme. A summary of the findings was completed in a table format.

The second data resource was obtained from the Malaysia Fire Rescue Department (JBPM) and the Royal Malaysian Police (PDRM). The Fire Rescue Department data contributes to the total number of rescue operations for children left in a vehicle from 2019 to 2022 in Malaysia. Further to that, reported cases to the Royal Malaysian Police shared the statistics on the reported forgotten children in vehicle cases from 2018 to October 2022. Descriptive data analysis was conducted to study and discuss the trend.

A structured interview with the officer was conducted to clarify the reported statistics further. This interview's main objective was to determine why parents or caregivers reported their children were left unattended in parked vehicles. Two officers had been chosen and were emailed asking for permission. Upon agreement to participate in the study, a set of questions was shared with them before the interview.

3. RESULTS AND DISCUSSION

3.1 News Analysis

The purpose of this article was to report the prevalence of forgotten children in parked vehicles among Malaysians from various news sources. The first data was obtained from Malay local news sources, including Berita Harian, Kosmo, and Utusan Malaysia. Table 1 presents the breakdown of the cases of child deaths due to being left unattended in parked vehicles according to specific factors, including year, age of the children, reason, duration, caregiver, and consequences.

As shown in Table 1, seventeen cases were retrieved from the local Malaysian news from 2012 to 2024. In the last year (2023), there were three cases reported, no cases in 2022, and four cases in 2021. This result somewhat surprises the nation and creates a significant concern among the responsible parties to look for the root cause. It can be seen from the table below that the age of children ranges from six months to eight years old. The main reason for them being left unattended by their caregiver was forgetting. Analysis showed the longest prolonged duration was 10 hours, and the lowest was two hours

until the caregivers realized their children were left unattended in the car. Results also revealed that 90% of the caregivers were mothers. In all cases, the consequences reported of the children's death due to the heatstroke. Overall, these results indicate that the prevalence of forgetting children in parked vehicles is serious among Malaysians due to its occurrence.

TABLE 1: Summary of related Malaysian news from 2012 to 2024

No	Year	Age of the Victim		Duration Left Unattended (hours)	Adult / Caregiver (age)	Consequences
		Years	Month			
1.	2024	5y	-	4 hours	Mother (34)	Death due to heatstroke
Description					A five-year-old girl died after being found unconscious in her mother's car parked near the back door of the hospital. Police received a report regarding the incident from a hospital medical officer involved at 8.01 pm. From the result of the initial investigation, it was found that the victim was believed to have been left by his mother by accident in a car after the victim was taken from a kindergarten (TASKA) near the scene of the incident at around 2 pm. The victim was said to be asleep, and the car engine was turned off. The victim's mother is believed to have only become aware of the incident after being contacted by her husband at 6 pm.	
2.	2023	-	8m	7 hours	Mother (N/A)	Death due to heatstroke
Description					A baby died and was sent to the hospital after being left unattended for almost seven hours. the victim's mother placed the victim in the back of the left passenger seat in her car to be sent to the nursery. However, the victim's mother continued to drive her car to work thinking that the baby had already been sent to the nursery. The victim's mother only realized that the victim was still in her car on the evening of the same day after being informed by her husband that the victim was not sent to the nursery.	
3.	2023	-	16m	8 hours	Father (N/A)	Death due to heatstroke
Description					A baby was found unconscious in a car at a public university. The baby (victim) was taken to the Department of Forensic Medicine, for an autopsy. The police received a report related to this incident at 4.30 pm. The baby involved was found dead as soon as the police arrived at the scene. The initial investigation found that the baby's father forgot to send him to the childcare center located on the campus.	
4.	2023	2y	-	8 hours	Mother (30)	Death due to heatstroke
Description					A baby was left in a vehicle after the mother thought she had sent the victim to kindergarten. The investigation found that at 7 am, the victim's mother sent her two children to a nearby school and then to a nearby kindergarten to drop off the victim. Arriving at the kindergarten, the victim's mother stopped for a moment to complete business matters online, so she forgot to drop the victim off at the location. The victim's mother immediately returned home and only realized that the victim was in the car at 3.35 pm in a state of unconsciousness. The victim was taken to hospital for further treatment and was pronounced dead.	
5.	2021	8y	-	3 hours	Driver (34)	Death due to heatstroke
Description					Forgotten, left in a van from 1430-1730 hours, parked outside the driver's house. He was supposed to send the victim to a nursery.	
6.	2021	3y	-	5 hours	Grandmother (NA)	Death due to heatstroke
Description					The victim was being left in a car by her grandmother for about 5 hours. The victims together with her sister were driven by their grandmother to school around 1300 hours. By the time her grandmother went back home and parked the locked car, leaving the victim inside. The absence of the victim was only realized by her mother around 1800 hours and started searching.	

7.	2021	3y	-	4 hours	School Principal (49)	Death due to heatstroke	
Description				It was an unusual morning as both parents could not drop the victim at the preschool due to a work event. Thus, they asked the principal of the school to pick up their kid for that day. The incident happened as the principal forgot the child and as a result, left that child in the car for about four hours before realizing it at 1215 hours. The child was found unconscious and was rushed to the nearest hospital.			
8.	2020	4y	-	10 hours	Father (NA)	Death due to heatstroke	
Description				After dropping her sister at her secondary school, the father went straight to his workplace, forgetting the victim was still asleep in his car. He was supposed to drop the victim at his grandmother's house as the mother was working as well. The grandmother did not suspect anything as she assumed that the father might be taking leave that day to take care of her granddaughter. The victim was found dead in the back of the car seat after her father had finished working for the day, ready to go back home around 1820 hours.			
9.	2020	-	9m	4 hours	Father (38)	Death due to heatstroke	
Description				After finished sending his other two daughters to their respective school, as well as his wife to work that morning, he went straight to his workplace, instead of sending his youngest daughter to a nursery. Resulting in leaving his 9-month-old daughter in a car for about 4 hours. The victim was found in the car around 1300 hours, as his father went out for lunchtime.			
10.	2019	3y	-	2 hours	Grandfather (73)	Death due to heatstroke	
Description				The victim accompanied her grandfather picking up her siblings from school. After they reached home, the grandfather went straight into their home without checking whether all of his three grandchildren were out of his car. The absence of the victim was only realized after two hours by her mother as she did not see her together with her siblings. After searching, the victim was found unconscious in the car and pronounced dead at the hospital they rushed to for medical support.			
11.	2019	3y	-	(NA)	Mother (31)	Death due to heatstroke	
Description				The victim was accompanying her mother to pick up her other siblings from school around 1300 hours. After getting back home, the mother asked for her oldest siblings to bring her sister out of the car, and then her mother went upstairs to pray. The absence of the victims was realized around 1535 hours as she called for her daughters to eat. After searching, the victim was found unconscious with injuries on her skin.			
12.	2018	2y	-	4 hours	Mother (32)	Death due to heatstroke	
Description				Forgotten by her mother who is working in a college in Port Dickson, who went straight to her office right after sending one of her daughters to school. The victim was left in a car for four hours before her mother realized.			
13.	2018	6y	-	3 hours	Driver (21)	Death due to heatstroke	
Description				Victims dozed off along the journey to school in a school van. 3 out of 4 children boarded the van except the victims. After that, the driver went back home and left the locked van unchecked at the parking lot. 3 hours later, the driver found the boy unconscious in the van as he was ready for a pickup of the kids from school. The boy was immediately rushed to hospital Sungai Buloh; however, he was pronounced dead on arrival.			

14.	2016	1y	-	5 hours	Father (NA)	Death due to heatstroke
Description				The father was supposed to send his daughter to a nursery but forgot to do so. He did not realize that his wife had put her daughter in a car until the victim's babysitter called to check why he had not sent his daughter to the nursery yet.		
15.	2014	3y	-	9 hours	Both father (41) and mother (39)	Death due to heatstroke
Description				Forgotten by his parents, left in a car for over 9 hours due to the hectic first day of school (of the new semester/year).		
16.	2013	3y	-	5-6 hours	Mother (NA)	Death due to heatstroke
Description				Right after sending her younger sister to the airport, the mother went straight to her school, forgetting her sleeping daughter whom she was supposed to send to nursery before work. This happened due to a lapse in memory as the task to send her daughter to nursery had been undertaken by her sister a few days before the incident happened. She only realized her mistake 5-6 hours later as she was about to go back home from school at 1730 hours. She then rushed to a nearby clinic for immediate medical assistance, where a doctor pronounced her dead upon arrival.		
17.	2012	5y	-	5 hours	Mother (40)	Death due to heatstroke
Description				As the mother running late to school, she went straight to her workplace, instead of sending her sleeping son (in the backseat of the car) to nursery. Her son's unconscious body, with a frothing mouth, opened eyes, and bleeding nose was found at 1330 hours. The victim was pronounced dead upon arrival at the hospital.		

Based on the findings, it can be summarized that the root cause was mainly due to forgetting. Forgetting or memory lapses is ordinary in humans. The term cognitive failure can also be used to explain the situation further. Cognitive failure refers to the temporary lapses or errors in cognitive processes such as perception, memory, attention, or reasoning. These failures can manifest in various ways, such as forgetting appointments, misplacing items, having difficulty concentrating, or making mistakes in routine tasks. While occasional cognitive failures are normal and happen to everyone, frequent or severe cognitive failures may indicate underlying issues such as stress, fatigue, anxiety, or certain medical conditions (Deng et al., 2022; Craig, 2022).

According to Carrigan and Barkus (2016), factors contributing to cognitive failure include high levels of stress, mental or physical tiredness, sleep deprivation, juggling multiple tasks simultaneously, aging, medical conditions, and lastly environmental factors. Managing cognitive failure involves addressing underlying causes such as stress, fatigue, or medical conditions, practicing stress management techniques, maintaining a healthy lifestyle including adequate sleep and regular exercise, and employing strategies such as mindfulness, organization, and prioritization to improve cognitive function and reduce errors.

Memory failures and lapses of attention, commonly known as absent-mindedness, are common in everyday life (Jonathan et al., 2008). When such individuals with memory and concentration impairment were asked how these occurrences affect their lives, they frequently reported what appear to be normal lapses like forgetting what they are looking for when opening the refrigerator or not remembering to stop for grocery shopping on the way home from work (Jónsdóttir et al., 2008). These kinds of lapses in memory and concentration can occur to any healthy individual. They can be seen as nothing major until some accident happens to result in fatality or injury. Neuropsychology tests of memory and attention have been done on individuals who complain of deficits in memory or attention and often obtain standard scores. This proves that healthy individuals can forget something, unintentionally make mistakes, and have lapses in their attention.

Research conducted on how memory works, lapses, and errors that lead to forgetting children in vehicles among caregivers by Diamond (2019) and his colleagues reported that memory failure occurs as the caregiver fails their child's presence in the vehicle's back seat. This is due to the tendency of the caregiver's memory to go into autopilot while acting on the everyday activity that has become a habit

memory. Habit memory, in this context, refers to retrospective memory that involves storing, processing, and retrieving information from past experiences. On the other hand, prospective memory is the extension of retrospective memory and consists of storing information about plans and their execution in the future. A reminder is needed to put the prospective memory or autopilot state of mind into action, like dropping a child at a nursery before work.

The behavior of leaving children in a parked vehicle for a short time is considered intentional. A tragedy happens when caregivers forget about the situation. Focusing on the things at hand, for example, a mobile phone, will cause an attention failure towards the child's presence in the backseat. Without any reminder to the caregiver to trigger the memory or attention, the child will be forgotten in the vehicle instead of being sent to a nursery or school or ensuring they enter home safely after a long ride. According to the reported cases, in most situations, children were forgotten because they were sleeping. No sound or movement was made by the children in the car, thus leading to their being left unattended by their parents or caregivers. Unintentional actions of leaving children in parked vehicles and forgetting about them occurred without any awareness from the caregivers regarding the child in the vehicle's back seat. This reflects the situation where their attention focuses on more than one thing, leading to attention failure. According to (Unsworth et al., 2012), attention failure is a temporary shift of attention away from the task at hand to internal thought or wandering mind and external stimulation until it leads to failure to perform an intended action. Some rush to work or purposefully rest at home after completing chores.

Table 2 below summarizes the number of deaths categorized by age, as discussed earlier. It shows that out of a total of 17 deaths, the majority (10 deaths) occurred among children aged 1 to 3 years. There were two deaths reported for infants under one year old and five deaths for children above three years old. This data highlights that children aged 1 to 3 years are the most vulnerable to this tragic event.

TABLE 2: Victims according to age

No	Age (Years)	Total
1.	Less than 1 year	2
2.	1 to 3 years	10
3.	Above 3 years	5
Overall Total		17

3.2 Secondary Data Analysis

The next section of this paper discusses the secondary data obtained from local authorities concerning children trapped in parked vehicles in Malaysia. Table 3 summarizes the findings. The result shows that the total number of reported rescue missions handled by the Malaysia Fire Rescue Department (JBPM) to save trapped children in parked vehicles was 2,520 cases from 2019 to 2022. Eight victims were injured, and four died in four years. A total of 305, 298, and 309 cases were reported in 2019, 2020, and 2021, respectively. A significant increase in the year 2022 can be seen, with 1,608 number of cases (Figure 1). Moreover, there are also five injuries, and four death cases reported in 2022 alone.

Based on the interview with the rescue department officer, most reported cases are due to children trapped because of vehicle technical failures, such as system errors involving doors and windows. They also highlighted that the high number of prevalences does not reflect parents or caregivers leaving their children unattended due to forgetting about the presence of their children in the car. Parents and caregivers are prone to call the fire rescue department to ask for help rather than trying to open the locked door or window independently. The most interesting aspect of this finding was that it clearly explains why high numbers of reported children were trapped in vehicles in Malaysia. This data can be used further to create awareness among caregivers to be extra cautious when dealing with their children involving a vehicle. Another factor that can lead to children being locked in vehicles is the child playing unattended (Null, 2016).

Table 4 presents the number of cases involving forgotten children in vehicles reported to the police by caregivers or concerned citizens between 2018 and 2022. The number of cases reported to the police is significantly lower compared to the statistics from the Fire and Rescue Department, largely due to the differing nature of reports received by the two agencies. Police reports are typically filed in cases involving fatalities, while the Fire and Rescue Department records all rescue operations, regardless of outcome. From January 2018 to October 2022, a total of eight police reports were lodged. Two cases were reported in both 2018 and 2019, rising to three in 2020 – the highest during the period. Only one case was recorded in 2021, and no incidents were reported in 2022.

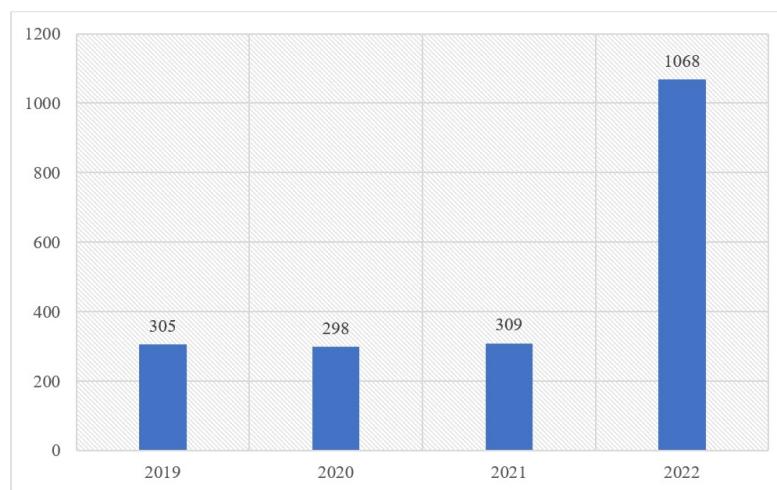


FIGURE 1: Reported cases of children trapped in a vehicle (JBPM data)

TABLE 3: Reported cases of children trapped in a vehicle received by the Malaysia Fire Rescue Department (JBPM) from 2019-2022

No	State	2019	2020	2021	2022	Total
1	Perlis	2	1	1	18	22
2	Kedah	63	51	52	152	318
3	Pulau Pinang	6	4	19	107	136
4	Perak	48	32	27	105	212
5	Selangor	18	16	6	219	259
6	Kuala Lumpur	6	16	19	73	114
7	Negeri Sembilan	29	21	32	181	263
8	Melaka	13	8	19	78	118
9	Johor	34	49	47	126	256
10	Pahang	5	19	10	51	85
11	Terengganu	36	29	38	58	161
12	Kelantan	11	14	18	96	139
13	Sabah	10	15	9	225	259
14	Sarawak	3	2	4	87	96
15	Labuan	4	3	0	7	14
16	Putrajaya	17	18	8	25	68
Total		305	298	309	1608	2520
Injured		2	0	1	5	8
Death		0	0	0	4	4

TABLE 4: Reported cases from the Malaysia Police Department (PDRM)

No	State	2018	2019	2020	2021	2022	Total
1	Kedah	0	1	1	0	0	2
2	P. Pinang	0	0	0	0	0	0
3	Selangor	1	0	1	0	0	2
4	N. Sembilan	1	0	0	1	0	2
5	Johor	0	0	0	0	0	0
6	Pahang	0	0	1	0	0	1
7	Sabah	0	1	0	0	0	1
8	Kelantan	0	0	0	0	0	0
Total		2	2	3	1	0	8

4. CONCLUSION

The findings underscore a critical yet underreported issue in Malaysia involving children left unattended in parked vehicles. While public perception often attributes these incidents to caregiver negligence, this study reveals that system-related errors also play a significant role. The low number of official reports suggests a gap in awareness and reporting mechanisms. These insights highlight the need for comprehensive public education, technological safety enhancements in vehicles, and stronger policy frameworks to prevent future tragedies.

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