



## A study on Unintentional injury and its impact among Children in Thirumazhisai, Chennai, India

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### ABSTRACT

Injury-related death accounts for 9% of mortality, worldwide. Unintentional injury accounts for a major part of injury-related disability-adjusted life years. Unintentional injury in children is of importance because it contributes a major part to child mortality and can also potentially have long-term effects. A cross-sectional study was conducted to find the incidence of unintentional injury in children of age 1 year to 18 years, in a sub-urban area, Thirumazhisai, in Chennai, India. The study was conducted from January 21, 2019, to March 21, 2019. The study was conducted on 144 participants, which included the primary caretaker of the child with unintentional injury, which occurred within the last 3 months, using pre-designed semi-structured questionnaire. The data was collected and analysed using Microsoft Excel and SPSS software. The study results showed that among the 144 participants, 75 were males and 69 were females. The cause of injury was recorded and classified as those due to playing outdoors (38.9%), domestic accidents (25%), sports-related injury (8.3%) and other injuries (30.6%). The commonest injury was abrasions (45.1%) followed by cuts & lacerations (30.6%). Commonest body parts affected were hands (47.9%) and legs (46.5%). Around 30% had to take leave from school for up to 2 days, 26% had to take leave for more than 2 days and 25% had local pain. The injury was treated at healthcare centre in only 52.8% of the study group. Unintentional injuries sustained while playing outside were more common among caretakers who had only up to school education and those who were unemployed/housewives. Health education and awareness creation can be done for primary caretakers on the prevention of unintentional injuries as it can affect their schooling and create financial problem for the family.



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### INTRODUCTION

The United Nations Convention on the Rights of the Child, article 1, specifies that children include all those below the age of 18 years. In India, they constitute 38% of our population ([Gururaj, 2013](#)). An injury is defined as “body damage due to sudden transfer of energy (physical, mechanical, chemical, thermal or radiant) resulting from an interaction of agent, host and environment and beyond the physical tolerance of an individual” Injuries are classified unintentional and intentional based on intent. Unintentional injuries include Road Traffic Injuries

(RTIs), falls, burns, poisoning, drowning, occupational injuries, sports injuries, fall of objects and injuries in disaster situations. Injuries among children are seen at home, on road, in school and even at some work places (with child labour being common in India) (Peden *et al.*, 2000).

Injuries are among the leading causes of several short-term and long-term disability and sometimes even death in children in India (Rivara *et al.*, 1989). With decline in the incidence and prevalence of many communicable diseases, injuries are now coming up as one of the major causes of morbidity and mortality, especially among individuals under 18 years of age in India. Based on available data, it is estimated that injuries result in death of nearly 1,00,000 children every year in India and hospitalisations among 2 million children (Peden *et al.*, 2000).

In addition, epidemiological and socio-demographic transition along with environmental and behavioural changes due to globalization, urbanisation, migration and media impact has resulted in the emergence of injuries as a leading public health problem.

Previous studies and reports on childhood injuries have focused mainly on injuries treated in the hospital setting or emergencies only (He *et al.*, 2014). It is largely unknown, what proportion of the injuries treated clinically is accounted for by those treated in the emergency versus those treated otherwise or those untreated.

Hence, the present study aims to study the unintentional childhood injury in individuals aged between 1 year and 18 years of age and the varying impact it has on the lives of the affected children and their family. It also tries to improve the awareness and consciousness in preventing the occurrence of such injury further.

## MATERIALS AND METHODS

### Study Design

Community-based descriptive cross-sectional study.

### Study Area

The study was conducted in a sub-urban area, Thirumazhisai, in Chennai, Tamil Nadu.

### Study Population

Primary caretakers of 144 individuals between the age group of 1 and 18 years who had injury in the last 3 months were considered for the study.

### Sample Size

By Convenience sampling method, 144 individuals aged between 1 and 18 years, who had unintentional

injuries within the past 3 months were included in the study group.

### Study Period

Study was conducted between January 2019 and March 2019 for a period of 3 months.

### Study Tool

A pre-designed semi-structured questionnaire, consisting of questions regarding the socio-demographic details of the participants, the type of injury, details about the injury event, the management & treatment modality for the injury and the impact caused due to the injury was used for data collection.

### Data Collection Method

Data was collected from the participants by door-to-door visits in households in Thirumazhisai and filling the pre-designed semi-structured questionnaires.

### Data Analysis

Data was recorded in Microsoft Excel spreadsheet and analysed using SPSS software.

### Ethical Approval

Ethical approval for the research project was obtained from the Institutional Ethical Committee.

## RESULTS AND DISCUSSION

### Socio-Demographic details of the study participants

It was found that among the 144 individuals who participated in the study, 75 were males (52%) and 69 were females (48%). Around 46.6% of the study participants were in the age group of 6 – 12 years. Mother was the primary caretaker in 70.8% of the individuals. Around 80% of the study participants had minimum up to school education. Since most of the caretakers were mothers, 77% of the participants were unemployed/ unskilled owing to their housewife status. Around 48.6% of the study participants belonged to upper middle socio-economic status (Table 1).

### Details about the Unintentional Injury among study participants

The causes of injury were reported as follows: playing outdoors (38.9%), domestic injury (25%), recreation-related injury (13.2%) and sports related injury (8.3%). The rest reported other causes of injury such as injuries due to dog bites, road traffic accidents, fall of objects on the body, etc. making up the remaining 21.5% of reported injuries. The common injuries seen in the study population

**Table 1: Socio-Demographic details of the study participants**

Sl. No	Variable	Frequency	Percentage
1.	Age of the Child: (in years)		
	1 – 5	47	32.6
	6 - 12	67	46.6
	13 – 18	30	20.8
2.	Sex of the Child		
	Male	75	52
	Female	69	48
3.	Primary Caretaker of the Child		
	Mother	102	70.8
	Father	17	11.8
	Grandparent	19	13.2
	Other	6	4.2
4.	Educational Status of Primary Caretaker		
	Illiterate	6	4.2
	Primary School	25	17.4
	Middle School	63	43.8
	High School	30	20.8
	Under-graduate	17	11.7
	Post-graduate	3	2.1
5.	Occupation of Primary Caretaker		
	Unemployed	7	4.9
	Unskilled	42	29.2
	Semi-skilled	68	47.2
	Skilled	27	18.7
6.	Socio-Economic Status of Family: (according to modified Kuppuswamy scale)		
	Upper Class	24	16.7
	Upper-Middle Class	70	48.6
	Lower-Middle Class	37	25.7
	Lower Class	13	9.0

were Abrasions (45.1%), Cuts & Laceration (30.6%), Contusion (20.8%), less commonly, Scalds & Burns (13.8%), Prick injury (12.5%) and rarely Fractures (7.6%). Also, noteworthy, is that nearly 70% (68.8%) of the individuals reported only 1 injury whereas 31% of individuals reported of having suffered 2 or more injuries per causative event. It was also found that most injuries affected the hands (47.9%), legs (46.5%), torso (11.8%), shoulders (8.3%), chest (6.3%) and head (1.4%), (Table 2).

Of all the injured children, it was found that 52.8% were treated at an institution, 17.6% were treated at home or by other practices and 29.6% were left untreated. In the 52.8% who were treated at healthcare centres, around 78% had full recovery with one visit, and the rest (22%) had to visit the healthcare centre for 2 or more follow up visits. On further assessment, it was found that, of those treated at a healthcare centre, 74% were treated in the clini-

cal setting, whereas 26% were treated in the E.R. As a result of the injury caused, about 38% children had to take leave from school and couldn't do their day-to-day tasks and 20.83% had to take leave from school for more than 2 days; 25% had no significant impairment in their routine activities (Table 2).

#### **Association between Sports/Outdoor injuries and socio-demographic details of the study participants**

It was found that a significant number of injuries were reported in households where the primary caretaker had only up to school education. Most of the injuries were reported in the age group of 6 to 12 years. The injuries had a higher prevalence among children whose primary caretakers were unemployed owing to their housewife status (Table 3).

Each year, among those individuals under 19 years

**Table 2: Details about the Unintentional Injury among study participants**

Sl. No	Variable	Frequency	Percentage
1.	Cause of Injury		
	Sports Injury	12	8.3
	Playing Outdoors	56	38.9
	Domestic Accidents	36	25.0
	Others	43	30.6
2.	Type of Injury		
	Cut/Laceration	44	30.6
	Abrasion	65	45.1
	Contusion	30	20.8
	Scald/Burn	20	13.8
	Prick	18	12.5
	Fracture	11	7.6
3.	Affected part of the body		
	Hands	69	47.9
	Legs	67	46.5
	Chest	9	6.3
	Torso	17	11.8
	Shoulders	12	8.3
	Head	2	1.4
4.	Management of Injury		
	No Treatment	39	27.1
	Home Treatment	57	39.6
	Medical Treatment	47	32.6
5	Impact of injury on children		
	Leave from School < 2 days	26	18.06
	Leave from School > 2 days	30	20.83
	Permanent disability	1	0.69

of age, more than 12,000 die due to unintentional injury due to various causes and more than 9.2 million individuals of the under 18 age group are treated in the emergency departments for non-fatal injuries (Borse and Sleet, 2009). A similar study (Nongkynrih *et al.*, 2017) cites that unintentional injuries are a leading cause of childhood mortality (especially between 10 years and 19 years of age) and contribute to 90% of the deaths of individuals less than 19 years of age, in India. About 60 % of injuries in children in India is unintentional, according to another study (Chandran *et al.*, 2010), in 2018. Of these injuries, most go unnoticed.

In this study, it is found out that majority of unintentional injuries were due to accidental injuries while playing outside. Similar study done in South Delhi found home injuries to be the commonest type of injury and injuries among children. It was the second most common type of injury in the 5-10 years age group (45.1%), which is comparable to this study (46.6%) (Bhuvaneswari *et al.*, 2018). This

shows that 6-12 years of age group are more vulnerable to unintentional injuries as they are more actively involved in playing outdoors in schools and are not under the constant supervision of their parents.

From the present study, it is evident that many injuries are preventable, such as dog bites and road traffic accidents (21%) and scalds and burns (13%). A study done by Rivara, F.P *et al* showed similar results (Rivara *et al.*, 1989). As for the consequence of the injuries, the present study has found that more than 50% of the children with such injuries could not carry out their routine tasks for 2 or more days following injury. Comparing this with a similar study (Gururaj, 2013), which has found that 60% of those injured had to take leave from school for 2 or more days and around 30% had some form of permanent damage. This emphasises the need for better and effective preventive measures to reduce the occurrence of injury.

The study has also shed light on certain areas of

**Table 3: Association between sports/Outdoor injuries and socio-demographic details of the study participants**

Sl. No	Variables	Sports/ Outdoor Injury (n = 66)	Out- door Injury (n = 78)	Chi-Square	P Value
1	Age of the child				
	<= 5 years	18 (12.5%)	29 (20.14%)	3.710	0.205
	6-12 years	36 (25.0%)	31 (21.53%)		
	13-18 years	12 (8.33%)	18 (12.5%)		
2	Sex of the child				
	Male	39 (27.0%)	36 (25.0%)	2.398	0.122
	Female	27 (18.75%)	42 (29.17%)		
3	Education of Primary Caretaker				
	Illiterate	3 (2.09%)	4 (2.78%)	0.035	0.982
	School Education	54 (37.5%)	63 (43.75%)		
	Graduate	9 (6.25%)	11 (7.64%)		
4	Occupation of Pri- mary Caretaker				
	Unemployed/Unskilled Workers	46 (31.94%)	55 (38.19%)	0.011	0.915
	Semiskilled/Skilled Workers	20 (13.89%)	23 (15.97%)		

development in the child's life, which can help in better prevention methods, such as: improving quality of life of children and their environment. Also, it showed that injured children from the upper classes (upper middle- and high-class families) were more commonly taken to a healthcare centre for check-ups, treatment and follow up visits as required, than the lower classes.

From the above table, it can be ascertained that there was no association between the educational status of the primary caretaker and the incidence of injury in the child. This is comparable with similar studies (Bishai *et al.*, 2008; Ma *et al.*, 2019), where it was found that the educational status of primary caretaker had no significant association with unintentional injury in the child.

The current study also shows that there was no significant association between occupation of primary caretaker and incidence of injury in the child, comparable with the results from the studies conducted by (Bishai *et al.*, 2008), which found that there was no direct association between the two. Another study (Ma *et al.*, 2019) found that there was an association between the occupation of primary caretaker and injury incidence in child, but the odds ratio were low enough to render it insignificant.

Also, the study has found that there was no significant association between age of child and incidence of injury. These results were similar to a previous study (Nongkynrih *et al.*, 2017), in which multivariate analysis of socio-demographical data shows there was no significant association between the age of child, nor the sex of child with incidence of unintentional injury, even though there was a significance in odds ratio. In this study, the injuries were more prevalent in the age group of 6-12 years. Contrary to the study results, a similar study done in North Kerala found the studies to be common in 1-5 years age group. This may be due to the fact that the latter study was done in the hospital setting (Rahim *et al.*, 2011). A similar study (Braun *et al.*, 2005) also found that associations between injuries and social risk factors such as social class were present but were much weaker than the more significant associations between injuries and child behaviour.

The above-mentioned findings provide potential targets on which awareness and education must be provided to the population, to increase prevention of such injuries in the future, and thereby improve the healthcare system. They also highlight the aspects of the lives of people inhabiting that region, which need improvement — in terms of quality of life, awareness about injuries and their

consequence, need for proper medical treatment for injuries, and so on.

The study also shows a need for safer environment for young children, especially those <12 years of age who had the highest number of injured cases, and the commonest injuries in this age group is due to playing outdoors and sports. This can be accomplished by creating safer playgrounds, protected environments for recreation and by making first aid readily available in these areas.

In the present study, it was found that 60% injuries were treated in the clinical setting and the rest 40% were treated in the E.R. The study also indicates that many childhood injuries requiring medical attention are treated in the clinical setting rather than in the emergency, where emergency treatment can potentially improve the disability status significantly.

## CONCLUSION

The present study shows that a large number of injuries in childhood are preventable, and are indicate a need for better health care and preventive measures within the population, regarding the quality of life. A safe home environment for a child should be a basic availability in all households. Most of the injuries seen were preventable, and this enhances the need for better knowledge and awareness among the population regarding the quality of life and healthcare at the household level. The main aspects for preventing incidence of unintentional childhood injury can include better and more knowledge in preventive measures, especially within the households improving the educational status of primary caretaker; proper treatment in healthcare centres for injuries; and educating and spreading awareness among children regarding injuries and their preventive measures.

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