

International Journal of Clinical and Diagnostic Pathology



ISSN (P): 2617-7226
ISSN (E): 2617-7234
www.patholjournal.com
2024; 7(4): 31-36
Received: 12-08-2024
Accepted: 20-09-2024

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Pattern of childhood injuries of urban slum dwellers in Dhaka City, Bangladesh

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DOI: <https://doi.org/10.33545/pathol.2024.v7.i4a.2029>

Abstract

Injuries are the most important cause of morbidity and mortality for children in high income countries and are increasingly so for children in low-and middle-income countries. However, the present study has conducted to describe the socio demographic information of respondents to identify the risk of childhood injuries among the study population, to describe the causes of childhood injuries, to find out the pattern and the factors associated with injury among children of 0-18 years and to describe the nature specific injury by age. The design of the study was descriptive type of cross-sectional study. The study was conducted at slum areas of Dhaka city in Bangladesh. Non-probability Random sampling method was used for the study. Total 400 respondents were selected for the study. Data were collected from children who are age in below 18 years. Data were collected from primary sources. A pre-design questionnaire was developed to use as data collection instrument. The questionnaires were a combination of closed ended and open-ended questions. Data was collected by face-to-face interview with the respondents by the questionnaire. Collected data were analyzed by computer program. For children under the age of 18 in Bangladesh, road traffic injuries, drowning, animal bites, poisonous substances, falls, burns, and electrocutions and fire-related burns pose significant and serious risk and are a leading cause of mortality, especially in rural areas. Despite this, there is limited evidence of what works to increase children's knowledge of injury prevention and decrease incidents of unintentional injury. So, there is an urgent need to develop programs to prevent injuries in low-income countries like Bangladesh. It is also important to reduce child injury instantly specially among 1-4 years children to achieve SDG. In the health sector existing program should be given priorities for injury prevention efforts as well as vulnerable group.

Keywords: Infant mortality rate, under-five mortality rate, childhood injury pattern of injury, disability-adjusted life years (DALYs), years of life lost (YLLs), years lived with disability (YLDs)

Introduction

Injuries are the most important cause of morbidity and mortality for children in high-income countries and are increasingly so for children in low- and middle-income countries. In 2007, falls ranked first as the leading cause of non-fatal injury events among children under 14 years old in the United States. Worldwide, death and injury rates vary by country and child gender ^[1].

It is estimated that about 35 million deaths globally were attributed to unintentional injuries between 2007 and 2017 ^[2]. Children are among the most affected population with injuries, and in 2015, about 177,000 children were estimated to have died of injuries in Africa ^[3].

Unintentional childhood injuries, including falls, road traffic injuries, and burns, contribute to high mortality and morbidity ^[1, 4]. Several factors contribute to the high burden of childhood injuries in low- and middle-income countries; these include the behavior of children, the employment of parents, social supports, rapid urbanization, and motorization with increased use of motorcycles ^[1, 5].

In most countries, drowning peaks among children between 1 and 4 years of age. The number of drowning incidents is estimated to be around 30,000 deaths each year, especially in low- and middle-income countries and rural areas ^[1]. In some parts of the world, such as Bangladesh, drowning is the most common cause of death for young children ^[3].

Injury can be defined as physical damage to the body resulting from acute exposure to thermal, mechanical, electrical, or chemical energy, or from the absence of such essentials as heat or oxygen. Injuries can be due to external causes, either intentional or unintentional, and are likely the most under-recognized major public health problem today. Injury is a leading cause of death and disability globally ^[1].

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According to the World Health Organization (WHO), more than 5.8 million people die each year from injuries, with a rate of 97 per 100,000 population [1]. Of these, 3.9 million are males (128.6 per 100,000) and 1.9 million are females (66.7 per 100,000) [2]. A quarter of these deaths are due to road traffic accidents, 16 percent to suicides, and 10 percent to homicides [2]. Globally, injury ranks as the fifth leading cause of death and accounts for 10 to 30 percent of all hospital admissions [2].

The WHO-World Bank Report suggests that road traffic injuries will be the third leading cause of mortality by 2020 [6]. In Bangladesh, basic health data is hard to gather due to a lack of consistent birth and death records. However, data from the Bangladesh Bureau of Statistics [7] and the Bangladesh Demographic and Health Survey [8] show a steady decline in the Infant Mortality Rate (IMR) and the Under-Five Mortality Rate (U5MR).

Recent evidence from the Demographic Surveillance System of the International Centre for Diarrheal Disease Research, Bangladesh (ICDDR, B), shows an increasing proportion of child deaths due to injuries. In 1983, nine percent of deaths among children aged 1-4 years were due to drowning; by 2000, this had risen to 53 percent [3].

Injuries claim more than 14,000 lives each day worldwide, more than five million annually. This figure surpasses deaths from HIV/AIDS, TB, and malaria combined [1]. In 2013, globally, 973 million people sought care for an injury, leading to disability-adjusted life years (DALYs) lost, years of life lost (YLLs), and years lived with disability (YLDs) totaling 247.6 million, 210.8 million, and 36.8 million, respectively [5].

Child injuries, although long neglected, now demand attention. Around 950,000 child deaths (<18 years) are attributed to injury and violence each year. In 2012, 83,604

children died from road traffic accidents, 74,712 from drowning, and 41,575 from fire-related burns. Child deaths from injuries are five times higher in low- and middle-income countries compared to high-income ones [9]. A higher risk of injury is observed in rural areas compared to urban settings, with numerous socio-economic factors (e.g., age and sex of the child, parental occupation, and family income) influencing these outcomes [1, 3].

Bangladesh is no exception. In rural Bangladesh, 72% of the population lives in conditions that expose children to significant injury risks, including poor housing, unsafe kitchens, and exposure to dangerous environmental hazards⁵. According to the Bangladesh Health and Injury Survey (BHIS), drowning and suicides are the two leading causes of fatal childhood injuries [4].

Despite the magnitude of the problem, there is limited research on injury prevention for children in low-income countries like Bangladesh. This study seeks to shed light on the burden and risk factors for child injury in rural Bangladesh.

Materials and Methods

A cross-sectional study in Dhaka's slum areas examined injury patterns among 400 children from July 2021 to June 2023. Using non-probability random sampling, data were gathered through face-to-face interviews with a pre-tested questionnaire and final data were analyzed by using statistical package for social sciences version 25.0. Consent was secured from both participants and local authorities, ensuring confidentiality and voluntary participation, with interviews lasting around 30 minutes each.

Results

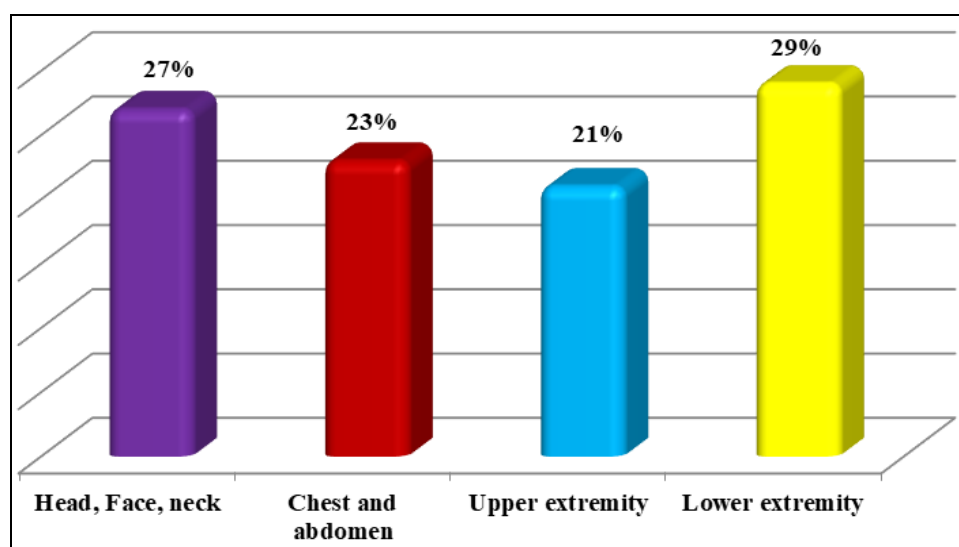


Fig 1: Site of injuries among the respondents according to anatomic site of the body

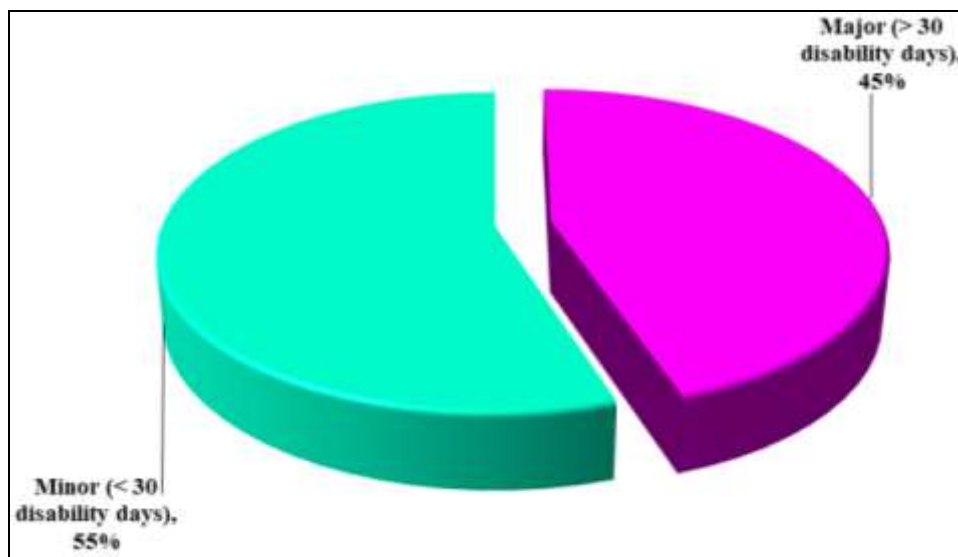


Fig 2: Severity of injury among the age group

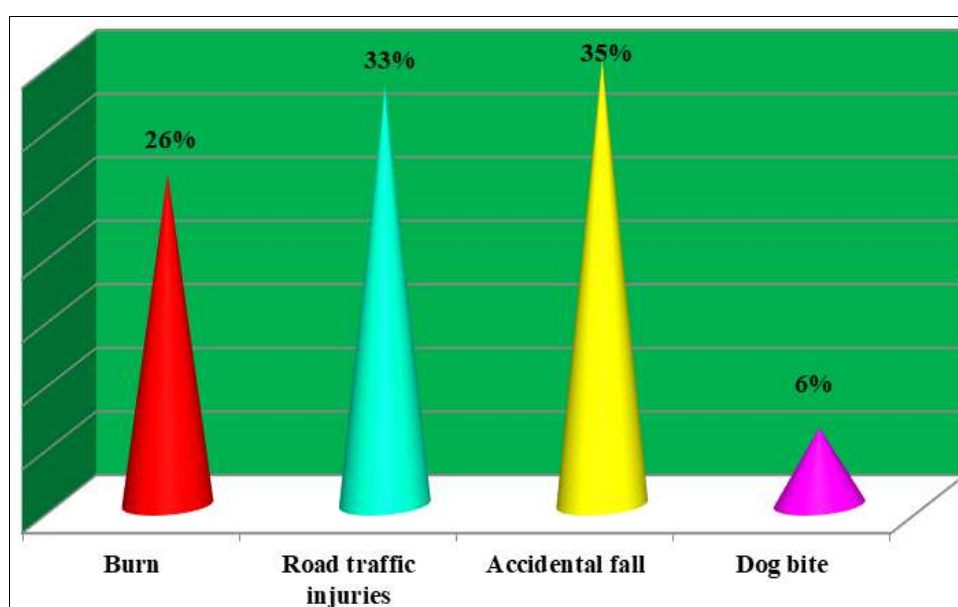


Fig 3: Modes of childhood injuries among the study population

Table 1: Socio-demographic information of the respondents

Age of child (years)	Percentage
Infant (<1)	5%
1-4	29%
5-9	26%
10-14	27%
15-17	13%
Gender	
Male	60%
Female	40%
Education qualification	
Class-1	7%
Class-2	12%
Class-3	14%
Class-4	11%
Class-5	16%
Class-6	10%
Class-7	8%
Class-8	13%
Class-9	9%
Total	100%
Occupation	
Student	12%

Driver	7%
Child laborers	43%
Tokai	38%
Total	100%
Religion	
Islam	81.8%
Hindu	15.8%
Buddhist	1.0%
Christian	1.5%
Total	100.0%
Father's Education	
Years of schooling	
0-4 Years	26%
5-8 Years	20.60%
9-12 Years	22.90%
13 Years and above	29.90%
Total	100%
Father's Occupation	
Service	19.20%
Business	27.10%
Agriculture	16.50%
Skilled labour	35.60%
Unemployed	1.60%
Total	100%
Mother's education	
Years of schooling	
0-4 Years	18.80%
5-8 Years	29.10%
9-12 Years	23.20%
13 Years and above	28.90%
Total	100.00%
Mother's Occupation	
Housewife	92%
Employed	8%
Total	100%

Table 2: Childhood injuries related information of the respondents

Causes of injury	Sex	
	Male	Female
Burn	15%	85%
Road accident	87%	13%
Occupational injury	56%	44%
Fall on street	54%	46%
Animal bite	75%	25%
Fall from roof	65%	35%
Drowning	81%	19%
Fall from tree	92%	8%
Electric Burn	82%	18%
Poisoning	71%	29%
Chemical burn	62%	38%
Nature of injury	Percentage	
Accidentally	49%	
Self-inflicted	44%	
By others	7%	
Total	100%	
Type of vehicles used to communicate to different places		
Rickshaw	27%	
Auto Van	15%	
Bicycle	9%	
Boat	3%	
Others (Bus, Taxi)	46%	
Total	100%	
Place of occurrence of the injury		
Home	19%	
School	13%	
Road/Street	18%	
Workplace	29%	
Sports area	14%	
Canal/river/pond	7%	
Total	100%	

Discussion

The survey results highlight significant demographic and socio-economic characteristics of the respondents, particularly focusing on children in vulnerable conditions. The findings align with global data on child mortality and injury prevention efforts outlined by various reports, including those from the World Health Organization (WHO) and other key studies on child injury in low-income countries like Bangladesh.

A large portion of the study population comprised children aged 1-4 years (29%), with males representing 60% of the respondents. This reflects findings from WHO's report on children's survival and well-being (2020) ^[10], which emphasizes that the early years of a child's life are critical for ensuring survival and reducing vulnerability to injury and disease. The study population in this survey, predominantly young and male, is highly susceptible to injury risks especially in low-resource settings. Additionally, the high proportion of child laborers (43%) and street children (38%) underscores the socio-economic challenges faced by these children. According to WHO (2020) ^[10], children living in poverty are at higher risk of injury due to unsafe environments and lack of proper safety measures ^[10].

The study results also reflect significant disparities in injury types between genders. For male respondents, falling from trees (92%) and road accidents (87%) were the leading causes of injury, while for females, burns (85%) were the most common. This finding resonates with the WHO (2014) ^[12] report on injuries and violence, which identifies road traffic injuries and falls as major causes of childhood injury, particularly in low- and middle-income countries (LMICs). Burns, especially among girls, are also a prominent issue in LMICs, as highlighted in Mashreky *et al.* (2010) ^[13], which identifies childhood burns as a significant health concern in rural Bangladesh ^[12].

Transportation and place of injury occurrence in this study also reveal important insights. The data indicates that 46% of respondents used buses or taxis for transportation, and workplaces were identified as the primary sites of injury (29%). The WHO (2007) ^[11] guide for ministries of health emphasizes the role of unsafe environments in exacerbating injury risks, particularly for working children in developing countries, where child labor is widespread. The study's focus on workplace injuries highlights the ongoing challenge of ensuring safety in these environments for children engaged in hazardous labor ^[11].

Moreover, the survey's findings on the severity of injuries where 55% were minor and 45% were major reflect the widespread underestimation of the burden of childhood injuries in LMICs, as also discussed by Mashreky (2012) ^[14] in the South East Asia Journal of Public Health. Many of these injuries go untreated or are inadequately addressed due to limited access to healthcare and safety interventions, particularly in rural areas like those covered in this survey. ¹⁴ Giashuddin *et al.* (2009) ^[9] also support the study's focus on socio-economic factors influencing childhood injuries. Their research on socioeconomic inequality in child injury found that lower-income families in Bangladesh face higher risks of child injury due to poor living conditions, inadequate parental supervision, and limited access to safety measures. This aligns with the present survey's findings on family backgrounds, where the education level of parents, particularly mothers, remains low (with 92% of mothers being housewives), further contributing to the cycle of

poverty and vulnerability ^[15].

In conclusion, this study's results highlight the critical need for targeted interventions to prevent childhood injuries in vulnerable populations, particularly in LMICs like Bangladesh. As indicated by WHO reports and other research, a multi-faceted approach addressing both socio-economic inequalities and environmental hazards is essential for reducing the burden of injury among children in these settings.

Conclusion

The survey revealed that most respondents were young children, predominantly male, with limited education, and many engaged in child labor or living as street children. The majority came from families with modest educational backgrounds, especially mothers, who were largely housewives.

Injury causes differed by gender: males were mainly injured by falls from trees and road accidents, while burns were the most common cause for females. Most injuries were accidental, often occurring at workplaces or homes, with the lower extremities frequently affected. While over half of the injuries were minor, a significant number were severe. The findings emphasize the need for interventions focused on child injury prevention, particularly in low-income, rural settings. Addressing socio-economic issues and enhancing safety measures could reduce childhood injuries in these communities.

Acknowledgments

The acknowledgments of the funding body, institutional head, co-workers, field assistants, local people etc. should be briefed and declaration of any conflict of interest related to the work. No formal funding for this study.

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How to Cite This Article

Akter T, Perveen N, Mondal S, Sen SS. Pattern of childhood injuries of urban slum dwellers in Dhaka City, Bangladesh. *International Journal of Clinical and Diagnostic Pathology* 2024; 7(4): 31-36.

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