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# Factors Associated with Childhood Unintentional Injury: Evidence from Hospital Data of Rajshahi City in Bangladesh

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## Abstract

**Background:** Childhood injury is becoming a global burden and major public health concern, particularly in developing countries such as Bangladesh. As a result, this study attempted to identify the factors influencing unintentional childhood injuries in Bangladesh.

**Methods:** A total of 822 data for this study were collected from four (4) particular hospitals in Rajshahi City, Bangladesh, from 2018 to 2019 by direct interviews with respondents using a structured questionnaire. Descriptive and multivariate statistical techniques were used to evaluate the indicated goals.

**Results:** The most prevalent causes of unintentional injuries were Road Traffic Injuries (RTIs) at 35.5% and falls at 37.7%, with a higher incidence in rural areas, among male children, and those without working status. Significant associations with unintentional injuries were found for variables such as place of residence, child sex, age, parents' education, household wealth index, number of family members, and children's working status. Specifically, for both RTIs and fall-related injuries, key predictors included the child's age, household wealth index, and mother's marital status.

**Conclusions**: The findings revealed that specific demographic and socio-economic factors are significantly associated with the risk of childhood unintentional injuries. Children from middle to richest family brackets and larger households face higher risk factors for Road Traffic Injuries (RTIs). Conversely, a higher household wealth index and older age of children are associated with a lower likelihood of experiencing fall-related injuries. Interventions targeting the age of children and household assets could be effective in mitigating unintentional injuries of children.

**Keywords:** Childhood injury; Fall injury; Hospital data; Household wealth index; Road traffic injury (RTI)

**Abbreviations**: LMICs: Low-and Middle-Income Countries; HICs: High Income Countries; BHIS: Bangladesh Health and Injury Survey; CI: Confidence Interval; OR: Odds Ratio; TV: Television; PCA: Principal Component Analysis; ICDDR: B: International Centre for Diarrhoeal Disease Research, Bangladesh

## Introduction

Child injury is a growing concern in both developed and developing nations, often cited as the primary cause of mortality following infancy [26]. It encompasses a wide array of health issues, each linked to distinct factors [23]. An injury is characterized as a bodily lesion at the organic level, stemming from acute exposure to various forms of energy that surpass the body's physiological tolerance threshold. In certain instances, such as drowning or freezing, injuries arise from a deficiency of essential elements [3]. Injuries are typically divided into two main categories: intentional and unintentional. Unintentional Injuries (UIs) include only those injuries that occur without intention of harm. Its include Road Traffic Injury (RTI), falls, drowning, poisoning, burns, cut, animal injury, machine injury, electrocution, etc. Intentional injuries include homicide, interpersonal violence, conflicts, suicide, and other forms of self-harm [32].




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Once children reach the age of five, unintentional injuries pose the greatest threat to their survival. According to the World Report on Child Injury Prevention (2008) [34], approximately 2,270 children die every day due to unintentional injuries. Injury and violence are major contributors to the deaths of children under 18 years worldwide, accounting for around 950,000 fatalities, with about 90% categorized as 'unintentional'. Road traffic accidents and drowning combined make up nearly half of all unintentional injury-related child deaths. Additionally, tens of millions of children require hospital care annually for non-fatal injuries, often resulting in lifelong disabilities [34]. Child injuries represent an escalating global public health concern, with injury being the leading cause of diminished healthy life and the second leading cause of disability in Pakistan [16,19].

The Global Burden of Disease (GBD) study estimated that Unintentional Injuries (UI) contributed to 18% of the 3.5 million deaths among the 1–19 years old in 2010 [22]. The World Health Organization (WHO) estimated that the injury-specific mortality in the under-five age bracket was 73 per 100,000 populations [46]. Unintentional injuries (UIs) significantly contribute to disabilities, impacting various aspects of children's lives, including relationships, learning, and play. Children living in poverty face the highest burden of injury, often lacking access to protective measures [24]. Unintentional injuries are a prominent cause of death among children and young adults, particularly in low- and middle-income countries, where they constitute a substantial portion of the overall morbidity burden among children aged 15 or younger [12,15,30,36].

The Bangladesh Health and Injury Survey (BHIS) was highlighted a significant shift in child mortality trends, with traditional causes such as communicable and non-communicable diseases declining while child injuries emerged as a major yet under-recognized health issue [37]. Injuries alone accounted for 12.2% of all identifiable deaths among all age groups and caused 3.2% of infant deaths, than rose to be the leading cause through the rest of childhood [4]. Key factors contributing to child mortality and morbidity identified in the BHIS survey included inadequate supervision, lack of information, hazardous environments, and the persistence of traditional beliefs regarding injury treatment as a matter of 'God's will' [37].

Drowning and falls were identified as the primary causes of injury-related mortality and morbidity in children over one year of age, with home environments being the most common locations for injury incidents. In Bangladesh, as in other countries experiencing epidemiological transitions, there has been a gradual shift in the causes of child mortality from infectious diseases to non-communicable diseases and injuries (Baqui et al., 1998). Studies conducted by the Demographic Surveillance System of the International Centre for Diarrheal Disease Research, Bangladesh (ICDDR, B), in 2000 revealed a growing proportion of child deaths attributable to injuries, although research on the burden of injuries remains limited [1,38]. Without a solid understanding of the basic epidemiology of injuries, effective prevention and acute care strategies cannot be implemented [11,42,43]. However, the majority of child health initiatives in Bangladesh prioritize the prevention of infectious diseases and malnutrition-related causes of child morbidity and mortality (Howlader et al., 2012) [2,6,14]. Consequently, this study aims to explore the risk factors associated with unintentional childhood injuries among Bangladeshi children, with the goal of enhancing knowledge, awareness, and preventive measures in this area.

## Methods

### Study Design and Participants

This study included children aged under 18 years, with a diagnosis of unintentional injury. The research utilizes data from both government and non-government hospitals, specifically looking at cases where injured children were admitted for treatment within a certain timeframe. The hospitals located in Rajshahi City were considered as the places of data source. The Rajshahi City, located in the western part of Bangladesh, serves as the headquarters of Rajshahi Division and is one of the seven metropolitan cities in Bangladesh. It boasts several private and government hospitals, among these hospitals only four were included in this study (Table 1). To facilitate this research study, data on injured children was collected from these hospitals through interviews with parents, caregivers, or directly from the injured children were admitted for treatment.

### Data Collection and Measurement

Unintentional injuries were identified by using codes: S00-S99, T00-T98, V01- V99, W00-W90, X00-X99, and Y00-Y34, which included motor vehicle crash injuries, falls, drowning, poisoning, suffocation, and animal bites [31]. Data were collected based on the inclusion and exclusion criteria, demographics, clinical characteristics, and outcome measures. The medical records and rescue register records of the emergency children were reviewed in detail, and the admission records were reviewed through the health records to determine their outcome. From these selected hospitals, data of 822 injured children were collected by interview method during period of June 2018 to March 2019. All these information was taken by using purposive sampling method [21].

### Statistical Analysis

The study analyzed participants' characteristics such as age, sex, causes of injury, and types of injuries along with socio-demographic characteristics of parents and children. Descriptive analysis was employed to summarize and describe the main

**Table 1:** Profile of Data Sources.

| Name of the Hospitals | Type of the Hospitals | Sample size($n$) |
|---|---|---|
| Rajshahi Medical College and Hospital | Government | 616 |
| Rajshahi Shishu (Children) Hospital | Government | 100 |
| Islami Bank Medical College and Hospital | Private | 62 |
| Islami Bank Hospital Rajshahi | Private | 44 |
| **Total sample($N$)** | | **822** |

**Table 2:** Percentage distribution of unintentional childhood injuries of children.

| Type of injuries | Frequency, n | Percentage (%) | 95% CI |
|---|---|---|---|
| Road trafficking | 292 | 35.50 | 32.20-38.90 |
| Drown/Sink | 23 | 2.80 | 1.70-3.90 |
| Fallen | 310 | 37.70 | 34.30-41.10 |
| Poisoning | 12 | 1.50 | 0.70-2.40 |
| Burn | 41 | 5.00 | 3.50-6.40 |
| Biting by other child | 21 | 2.60 | 1.50-3.60 |
| Beating by other persons | 8 | 1.00 | 0.40-1.60 |
| Animal bites (dog & peat bites) | 49 | 5.96 | 4.40-7.60 |
| Abused of drugs | 15 | 1.80 | 1.00-2.80 |
| Not stated (Hushed up) | 51 | 6.20 | 4.60-7.90 |
| **Total (N)** | **822** | **100** | |

***Note***: 'CI, Confidence interval'.

features of a data set succinctly and accurately. The Chi squared ($x^2$) test was used to determine whether there is a significant association or relationship between types of injuries and socio-demographic and injury related factors. Logistic regression models were used to determine the factors associated with Road Traffic Injury (RTI), injury due to fall, and other types of unintentional childhood injuries. Data analysis was conducted using the Statistical Package for Social Sciences (SPSS-26; SPSS, Inc., Chicago, IL). A two-sided p<0.05 was considered statistically significant.

### Variables Considered for Logistic Regression Analysis

Binary Logistic Regression Analysis performs when the category of dependent variable would have dichotomous in nature and explanatory variables will be categorical and continuous. Therefore, it is indispensable to get an idea about the conditions of the selected dependent variable and the predictor or explanatory variables for the sake of making this analysis more reliable, prominent and understandable. In the logistic regression models, unintentional childhood injury of children is considered as dependent variable with comprising to Model-1: Road Traffic Injury (RTI): 1= Yes, 0= No; Model-2: Injury due to Fall: 1=Yes, 0=No; and Model-3: Burn and other Injuries: 1=Yes, 0=No. Besides, Sex of children (1:Male, 2: Female); Age of children (1: ≤5 years, 2: 5-10 years, 3: 10-17 years); Mothers 'marital status (1: Married, 2: Others (divorced, widowed and separated); Mothers' education (1: Illiterate, 2 : Primary, 3: Secondary, 4 : Higher); Family member (1: ≤4 persons, 2: 5-8 persons, 3: 9+ persons); Wealth index (1: Poor, 2: Middle, 3: Wealthy); Working status of child (1: Not working, 2: Working); Educational level of child (1: No schooling, 2: Primary schooling, 3: Secondary Schooling).

In logistic regression analysis, $R^2$ is not computed in the same way as $R^2$ in OLS regression. As such, one cannot interpret it as proportion of variance accounted in the context of OLS regression. Nevertheless, one think $R^2$ as an index of the proportionate improvement in model fit relative to the null model (Pituch & Stevens, 2015). Based on $R^2$, we might say that the full model containing our predictors represents 13.00% in model-1; 62.00% in model-2 and 3.7% in model-3, improvement in fit relative to the null model. Besides, Hosmer and Lemeshow (H-L) test method (ρ<0.05 indicate poor model fit, near to be the 1 means the best model fit) to apply for the goodness of fit the models, all models have fit well.

### Ethical Approval

Ethical consideration was approved by the ethical committee of Institute of Biological Sciences at the 71st meeting of the Board of Governors of the Institute of Biological Sciences (Resolution No. 57) and of the meeting of the Syndicate of University of Rajshahi, Bangladesh (Memo No. 09(17)/320/IAMEBBC/IBSC).

## Results

### Percentage Distributions of Unintentional Childhood Injury

The study of unintentional childhood injury with its different types is described in the Table 2. The table outlines the percentage distribution of different types of unintentional childhood injuries, along with their frequencies and 95% Confidence Intervals (CI). Road trafficking is the most common cause, accounting for 35.50% of cases, followed by falls at 37.70%. Other significant causes include animal bites (5.96%), burns (5.00%), and drownings (2.80%). There are also smaller percentages of injuries due to poisoning, biting by other children, beating by other persons, abuse of drugs, and cases where the cause is not stated (hushed up). The total number of cases is 822. These findings highlight the diverse nature of childhood injuries and provide valuable insights for injury prevention efforts.

### Socio-Demographic Differentials and Determinants on Childhood Injury

Table 3 exhibits the different socio-demographic variables with corresponding frequency and percentage of each row in terms of childhood injury with total number of children including significance level with 95% CI. The table presents the socio-demographic characteristics of children and their parents, along with corresponding percentages and 95% CI. It reveals that the majority of injured children reside in rural areas (78.95%) and are predominantly male (78.71%). Most mothers are living with husbands (93.55%) and have varying levels of education, with a significant portion being illiterate (50.36%). Similarly, a substan-

**Table 3:** Percentage distribution of socio-demographic characteristics of the children and their parents.

| Characteristics | Number (n) | Percentage (%) | 95% CI |
|---|---|---|---|
| **Area of Residence** | | | |
| Urban | 173 | 21.05 | 18.30-23.09 |
| Rural | 649 | 78.95 | 76.00-81.60 |
| **Sex of children** | | | |
| Male | 647 | 78.71 | 75.70-81.50 |
| Female | 175 | 21.29 | 18.50-24.20 |
| **Mother's marital status** | | | |
| Living with husbands | 769 | 93.55 | 91.60-95.10 |
| Divorced | 14 | 1.70 | 0.90-2.80 |
| Separated | 4 | 0.49 | 0.10-1.2 |
| Widowed | 35 | 4.26 | 2.90-5.80 |
| **Mothers' education** | | | |
| Illiterate | 414 | 50.36 | 46.80-53.80 |
| Primary | 212 | 25.79 | 22.80-28.90 |
| Secondary | 161 | 19.59 | 16.90-22.40 |
| Higher | 35 | 4.26 | 2.90-5.80 |
| **Fathers' education** | | | |
| Illiterate | 350 | 42.58 | 39.10-46.00 |
| Primary | 141 | 17.15 | 14.606-19.90 |
| Secondary | 174 | 21.17 | 18.40-24.10 |
| Higher | 157 | 19.10 | 16.40-21.90 |
| **Number of family member** | | | |
| ≤4persons | 395 | 48.05 | 44.50-51.50 |
| 5-8 persons | 230 | 27.98 | 24.90-31.10 |
| 9 and above persons | 197 | 23.97 | 21.00-27.00 |
| **Wealth index** | | | |
| Poor | 322 | 39.17 | 35.80-42.60 |
| Middle | 166 | 20.19 | 17.50-23.10 |
| Wealthy | 334 | 40.63 | 37.20-44.00 |
| **Age of injured children** | | | |
| ≤5 years | 150 | 18.25 | 15.60-21.00 |
| 5-10 years | 311 | 37.83 | 34.50-41.20 |
| 10-17 years | 361 | 43.92 | 40.40-47.30 |
| **Working status of children** | | | |
| None | 669 | 81.39 | 78.50-83.90 |
| Own wish | 29 | 3.53 | 2.30-5.00 |
| Work for poverty | 119 | 14.48 | 12.10-17.00 |
| Family pressure | 5 | 0.61 | 0.20-1.40 |
| **Child's education** | | | |
| No schooling | 195 | 23.72 | 20.80-26.70 |
| Primary | 388 | 47.20 | 43.70-50.60 |
| Secondary | 239 | 29.08 | 25.90-32.30 |
| **Total** | 822 | 100 | |

***Note***: 'CI, Confidence interval'.

tial percentage of fathers are illiterate (42.58%). Families tend to have ≤4 members (48.05%) and are distributed across different wealth indices, with 39.17% classified as poor. The highest percentage of injured children falls in the age range of 10-17 years (43.92%), and a significant portion experiences organ damage (27.01%). Additionally, the majority of children do not work (81.39%) and have received primary education (47.20%). These findings underscore the diverse socio-economic contexts and age-specific vulnerabilities associated with childhood injuries, emphasizing the importance of targeted interventions to address these disparities effectively.

### Association between Unintentional Childhood Injury and Socio-Demographic Characteristics

To investigate the differentials and association of unintentional childhood injury among socio-demographic characteristics are demonstrated in Table 4. The table examines the relationship between socio-demographic factors and types of injuries among children. It reveals several significant associations. Rural residence correlates with higher injury rates compared to urban areas ($p < 0.006$), and males experience more injuries than females ($p < 0.001$). Children with illiterate mothers or from poorer households are at greater risk of injury ($p < 0.000$ for both). Older children (10-17 years) and those with organ damage or working are more prone to injuries ($p < 0.000$ for all). Additionally, families with 5-8 members have higher injury rates ($p < 0.015$), while the father's education and child's education show no significant association. These findings emphasize the importance of addressing socio-economic disparities and age-specific risks to reduce childhood injuries effectively.

**Table 4:** Association between socio-demographic factors and type of unintentional childhood injuries of children.

| Variables | Type of Unintentional Injuries (%) | | | | | |
|---|---|---|---|---|---|---|
| | Road traffic injury | Fall | Burn | Others | Total, % (*n*) | *p*-values |
| **Place of residence** | | | | | | |
| Urban | 9.25 | 5.60 | 1.34 | 4.87 | 21.05 (173) | **0.006** |
| Rural | 26.28 | 32.12 | 3.65 | 16.91 | 78.95 (649) | |
| **Child's sex** | | | | | | |
| Male | 29.68 | 29.44 | 2.80 | 16.79 | 78.71 (647) | **0.001** |
| Female | 5.84 | 8.27 | 2.19 | 4.99 | 21.29 (175) | |
| **Mother's education** | | | | | | |
| Illiterate | 16.67 | 19.83 | 2.07 | 11.80 | 50.36 (414) | **0.000** |
| Primary | 8.15 | 11.07 | 1.09 | 5.47 | 25.79 (212) | |
| Secondary | 9.37 | 4.62 | 1.34 | 4.26 | 19.59 (161) | |
| Higher | 1.34 | 2.19 | 0.49 | 0.24 | 4.26 (35) | |
| **Father's education** | | | | | | |
| Illiterate | 15.57 | 16.06 | 1.82 | 9.12 | 42.58 (350) | 0.216 |
| Primary | 4.99 | 5.96 | 1.09 | 5.11 | 17.15 (141) | |
| Secondary | 7.18 | 8.39 | 0.97 | 4.62 | 21.17 (174) | |
| Higher | 7.79 | 7.30 | 1.09 | 2.92 | 19.10 (157) | |
| **Number of family members** | | | | | | |
| ≤4 | 16.79 | 16.79 | 2.68 | 11.80 | 48.05(395) | **0.015** |
| 5-8 | 8.39 | 11.80 | 1.82 | 5.96 | 27.98(230) | |
| ≥9 | 10.34 | 9.12 | 0.49 | 4.01 | 23.97(197) | |
| **Wealth index** | | | | | | |
| Poor | 10.46 | 17.52 | 1.96 | 9.25 | 39.17(322) | **0.000** |
| Middle | 7.42 | 7.91 | 0.49 | 4.38 | 20.19(166) | |
| Wealthy | 17.74 | 12.29 | 2.55 | 8.15 | 40.63(334) | |
| **Age of injured children (in years)** | | | | | | |
| ≤5 | 4.01 | 7.54 | 1.46 | 5.23 | 18.25 (150) | **0.000** |
| 5-10 | 11.80 | 15.57 | 2.31 | 8.15 | 37.83 (311) | |
| 10-17 | 19.71 | 14.60 | 1.22 | 8.39 | 43.92 (361) | |
| **Working status of children** | | | | | | |
| Not working | 27.86 | 31.87 | 4.62 | 17.03 | 81.39 (669) | **0.000** |
| Working | 7.66 | 5.84 | 0.36 | 4.74 | 18.62 (153) | |
| **Child's education** | | | | | | |
| No schooling | 7.42 | 8.39 | 1.34 | 6.57 | 23.72(195) | 0.237 |
| Primary schooling | 16.79 | 17.88 | 2.55 | 9.98 | 47.20(388) | |
| Secondary schooling | 11.31 | 11.44 | 1.09 | 5.23 | 29.08(239) | |
| **Total** | 35..52 | 37.71 | 4.99 | 21.78 | 100 (822) | |

### Determinants of Road Traffic and Fall Injuries

The results of multivariate analysis, as shown in Table 5, containing summarizes of the determinants of unintentional childhood injuries among children, providing insights into the various factors influencing them. The findings indicated that age of children, marital status of mothers, family members, and wealth index were positive and significant association with Road Traffic Injury (RTI), while sex of children and fathers' educational status were significant negative association with Road Traffic Injury (RTI). The relative risk or odds of female predictors had 37.90% lower risk than male children for RTI, and the predictors' age of children, and family members had higher odds ratio for RTI which means as increasing children aged, and family members with increased their risk to fall RTI rather than other injuries. The findings revealed that middle, and richest family children had 57.90% and 2.488 times more risk for RTI than poorest family children. In case of fall injury, it was seen that mother's marital status, age of children and wealthy family were negative significant association with injury due to fall. The relative odds of age of children, and middle to wealthy family had lower risk for fall injury than poorest family children. The predictors of middle to wealthy households were 32.50 %, and 44.00% lower risk respectively for fall injury than poorest family.

## Discussion

The main aim of the study was to explore the risk factors associated with unintentional childhood injuries among Bangladeshi children concerned with the tertiary hospital data at Rajshahi city. It was seen that out of 822 children in this study, 78.95% from rural and 21.05% from the urban areas had sustained some form of Unintentional Injuries (UIs) such as 35.50% due to RTI, and injury due to fall 37.70% that were consistent with the findings from Makwanpur district of Nepal, South India and South Africa where the prevalence of UI was higher in rural than the urban area [13,27,29,33]. Such differences might be due to differences in environmental, infrastructural, economic and cultural related factors in both the areas [13,27].

The study results revealed that area of residence, age, sex of children, mother's education, family members, and wealth index of households were significant differences and association with the type of UIs. These findings were similar that UIs were notably more prevalent among boys compared to girls, with rural children being the most susceptible demographic [4,8]. Similarly, in Makwanpur, Nepal also the injury rate among boys was almost double than that of girls [33]. This may be due to behavioral differences among male and female children. The restless nature of boys makes it difficult to supervise and control them than the girls of same age group [20].

**Table 5:** Adjusted Odds Ratio (AOR) for the Effects on Road Traffic Injury (RTI), Fall Injury, and Burn and other Injuries (drowning, poisoning, animal bites, cut, biting, etc.) according to socio-demographic characteristics of respondents using Hospital Data at Rajshahi City, Bangladesh.

| Explanatory variables | Unintentional Childhood Injuries | | | | | |
|---|---|---|---|---|---|---|
| | Road traffic injury (RTI) | | Injury due to fall | | Burn and other injuries | |
| | AOR | 95% CI | AOR | 95% CI | AOR | 95% CI |
| **Area of Residence** | | | | | | |
| Urban (ref.) | 1.000 | | 1.000 | | 1.000 | |
| Rural | 0.772 | 0.502-1.187 | 1.652* | 1.053-2.593 | 0.763 | 0.479-1.217 |
| **Age of children** | **1.074*** | 1.036-1.114 | **0.962*** | 0.929-0.996 | 0.970 | 0.934-1.008 |
| **Child's sex** | | | | | | |
| Male [ref.] | 1.000 | | 1.000 | | 1.000 | |
| Female | **0.621*** | 0.418-0.923 | 1.087 | 0.756-1.564 | **1.484*** | 1.017-2.165 |
| **Fathers education** | | | | | | |
| Illiterate (ref) | 1.000 | | 1.000 | | 1.000 | |
| Literate | **0.597*** | 0.401-0.890 | 1.332 | 0.926-1.916 | 1.227 | 0.825-1.825 |
| **Mothers'marital status** | | | | | | |
| Living with husband [ref.] | 1.000 | | 1.000 | | 1.000 | |
| Others | **2.610*** | 1.417-4.808 | **0.410*** | 0.199-0.843 | 0.737 | 0.364-1.493 |
| **Mothers' education** | | | | | | |
| Illiterate [ref.] | 1.000 | | 1.000 | | 1.000 | |
| Literate | 1.460 | 0.979-2.176 | 0.967 | 0.668-1.402 | 0.705 | 0.469-1.061 |
| **Family members** | **1.110*** | 1.020-1.209 | 0.975 | 0.897-1.059 | **0.891*** | 0.797-0.996 |
| **Wealth index** | | | | | | |
| Poor[ref.] | 1.000 | | 1.000 | | 1.000 | |
| Middle | **1.579*** | 1.059-2.355 | **0.675*** | 0.459-0.992 | 0.959 | 0.631-1.458 |
| Wealthy | **2.488*** | 1.538-4.024 | **0.560*** | 0.348-0.900 | 0.712 | 0.423-1.199 |
| **Model summary** | | | **Model summary** | | **Model summary** | |
| Model $\chi^2$ = 81.678 -2LL = 987.949, Nagelkerke, $R^2$=0.130, Hosmer and Lemeshow (H-L), ρ=0.163, Model significant level, $p$< 0.001 | | | Model $\chi^2$ = 38.551, -2LL = 1050.831, Nagelkerke $R^2$=0.62, H-L, ρ=0.580, Model significant level, $p$< 0.001 | | Model $\chi^2$ = 21.368, -2LL = 933.627, Nagelkerke $R^2$=0.037, H-L, ρ=0.188, Model significant level, $p$≤ 0.05 | |

***Note:*** '[ref.], reference category', * indicate significant level at $p$≤0.05, 'OR, odds ratio', 'CI, confidence interval'

The Global Status Report of RTI projected that poor socio-economic condition will have a significant role in RTIs, and people from a lower socioeconomic status are more likely to be affected [44] The study results highlighted that the factors such as the sex, and age of children, mother's marital status, family members, and wealth index of households significantly influenced RTI. But age of children, mother's marital status, and wealth index of households were significantly affected fall injury. Studies conducted in LMICs and HICs were also found similar patterns of childhood injuries [9,18,28,37,40,41,45].

The results indicated that being female decreased the odds of RTI by 37.90% than male children. As increasing age of children, and family members were also more likely to experienced RTIs compared to other injuries. For instance, middle level, and richest family children had 57.90% and 148.80% more risky for RTI than poorest family children. Various studies from Karachi, Ujjain, and other SEA countries also revealed higher injury rates among male children than females [17,27,39]. In contrast, age of children, marital status of mothers, and households' status middle to wealthy level were lower risk for fall injury of their children. Households' wealth indexing was more likely to experience childhood injury for both of RTI, and injury due to fall. A prospective case-control study conducted in Bangladesh found that linkage of childhood injury and maternal illiteracy, pre-existing health issues in children, and low socioeconomic status [10]. The study findings noticed that lower socioeconomic conditions put individuals at higher risk for RTI, and fall injury as well as deaths of children.

## Conclusion

This study identifies significant factors influencing Road Traffic Injury (RTI) and fall-related injuries among children, including the place of residence, child's sex, age, mother's marital status, parents education, family members, wealth index of households, and child's working status. Middle level to richest family children were more vulnerable to experienced RTIs and fall related injuries compared to other childhood injuries. Therefore, the study emphasizes the need for targeted interventions, including enhancing supervision and education for older children, and improving household assets.

## Author Statements

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### Conflict of Interest

The author declares that there is no conflict of interest.

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