Interpersonal Violence-Related Mortality in Bangladesh: Insights from a Nationwide Survey

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Abstract

Violence is a critical global public health concern, ranking as the fourth leading cause of death worldwide, particularly among individuals aged 15–44 years. In Bangladesh, data on interpersonal violence mortality remains scarce. This study aimed to estimate the epidemiology of violence-related deaths through a nationwide cross-sectional household survey conducted in March–June 2016, encompassing 70,000 households (299,216 individuals) using multistage cluster sampling and verbal autopsy methods. The overall violence-related death rate was 4.0/100,000 population/year (95% CI: 2.3–7.0), with males disproportionately affected (7.3/100,000; 95% CI: 4.1–13.1). Urban areas reported higher rates (5.7/100,000; 95% CI: 2.6–12.3). Sharp-cutting objects caused half of the deaths, with transportation workers and males aged 20–29 years most vulnerable. Group riots or terrorist activities accounted for 58% of cases. Fatal violence was 11times higher in males (p=0.02). Targeted, coordinated efforts are urgently needed to prevent and control violence, particularly in urban settings.

Keywords: Violence; mortality; nationwide, epidemiology/cross-sectional, and Bangladesh.

Introduction:

Violence contributes to mortality, morbidity, disabilities, and a host of other health and social consequences across the world. In 2019, interpersonal deaths were responsible for 415,000 deaths worldwide, with 312,000 deaths in the 15–49 age group (1). For people aged 15–44 years, violence is the fourth leading cause of death globally (2, 3). The World Health Organization (WHO) defines violence as the use of physical force or power, threatened or actual, against oneself, another person, or against a group or community that either result in or has a high likelihood of resulting in injury, death, psychological harm, less development, or deprivation (4). The overall global homicide rate is 6.7 per 100,000 population, with rates of 3.8 per

100,000 population in all high-income countries and all regions (2, 3). The rate of fatal violence is not distributed consistently among age and sex groups.

Males account for 82% of all homicide victims and have estimated rates of homicide that are more than four times those of females (10.8 and 2.5, respectively, per 100,000 people) (3). The highest estimated rates of homicide in the world are found among males aged 15–29 years (18.2/100 000), followed closely by males aged 30–44 years (15.7/100 000) (3). In the case of domestic violence, women are the most affected by their male partners, and this is very common in LMCs (5-9).

Violence is one of the emerging public health problems in Bangladesh (7, 8) and it was found to be the fifth leading cause of death due to injuries, which is 7% of total deaths. In 2017, homicide claimed the lives of 478,000 people worldwide, with 4.3 per 100,000 people dying in low and middle-income Southeast Asian countries (10). More than 90% of all violence-related deaths occur in low and middle-income countries (2). In intentional injuries, suicide was found as the leading cause of injury and death in the age group of 15–19 years (2). The majority of domestic violence victims are women who stayed at home after marriage (7, 8). Dowry cases and familial conflict (33% and 32%, respectively) are the main backgrounds for violence against women (8). Although it has negative impacts on families, society, and the country, it has been neglected by public health policymakers around the world. Another study in India showed that the violence of women who had a lower household income, were illiterate, belonged to a lower caste, and had a partner who consumed alcohol (11). In Pakistan, up to 98.5% of women faced physical violence and up to 68% of women faced both physical and sexual violence from their intimate partners (12).

Similar to many low-and middle-income countries, Bangladesh is passing through an epidemiological transition where there are changes in the causation of deaths, morbidities, and disabilities (2). Injury is the leading killer of children after infancy (13). However, data on the magnitude and risk factors of injury, especially in low resource settings, is scarce (2). To enhance knowledge in this area, the epidemiology of injury is a priority task for researchers and policymakers. WHO has called for further studies on all forms of violence for effective prevention. The overall magnitude of interpersonal violence has not yet been documented in the country. This study aimed to explore the epidemiology of interpersonal violence in Bangladesh.

Methods:

Study design, Area and Study Population

A descriptive nationwide cross-sectional survey, Bangladesh Health and Injury Survey (BHIS) 2016, was conducted between March and June 2016 among 70,000 households with a total of 299,216 population in 16 randomly selected districts. It used a multistage cluster sampling strategy based on probability-proportional-to-size (PPS) methodologies with separate urban and rural samples. The BHIS 2016 was conducted to measure the current injury situation in Bangladesh after 13 years of the previous BHIS 2003. It defines injury in proportion to all other causes but without classifying them into specific communicable and non-communicable causes. It focused primarily on the epidemiology of fatal and non-fatal injuries, and it extended the definition of moderate severity to include any injury that resulted in the loss of 1 day of work, school attendance, or ability to care for oneself.

To represent the rural community, one Upazila (sub-district) was randomly selected from each district. A total of 69 villages from each Upazila and 50 households from each village were randomly selected. The district headquarters of randomly selected 16 districts and divisional headquarters (Static Metropolitan Area – SMA) constituted the urban areas. In urban areas, mohallas (urban subunits—mohalla is a term to describe a neighborhood or locality in the cities and towns having around 250 households) served as the clusters, and systematic sampling was done to identify the 50 households from each mohalla

to be included in the survey. This sample size was required in order to provide sufficient power to capture the rate of fatal injury events (13-16).

Case ascertainment

Violence has been defined as the intentional use of assault against someone who sustains physical injuries of force or power, threatened or actual, against oneself, another person, or a group or community. Interpersonal violence occurs between family members, intimate partners, friends, acquaintances, and strangers, and includes child maltreatment, youth violence, including that associated with gangs, and violence against women (1, 3, 17-19).

Data collection instruments

The questionnaire was adopted from the WHO and was first used in the Bangladesh Health and Injury Survey in 2003 (20). The same questionnaire was used again in the Bangladesh Health and Injury Survey in 2016. The questionnaire consists of four parts. It was developed to classify deaths and injury morbidity under broad categories and it was based on the WHO standard for verbal autopsies for data collection (20). There were four parts to the questionnaire: the face sheet, death event, injury morbidity, and injury mechanism. The recall periods for injury deaths and morbidities were one year and six months, respectively. Separate forms were used for each mechanism of injury. These instruments were adapted from the Vietnam Multi-Centre Injury Survey (21). Then the instruments were translated into Bengali as we collected the survey information in Bengali. The same instruments were used from the saving of lives from drowning (SoLiD) survey in Bangladesh (22).

Data collection procedure

Results:

In the survey, the urban population was 35.5 % and rural population was 64.5%. The proportion of males (50.2%) and females (49.8%) were almost equal. Among the total population, 7.8% were children under five years of age, 26.0% were

The data collectors received six-day training on the data collection tool. They collected data through face-to-face interviews by paying for household visits. The respondents were adult household members aged 18 and over. The heads of the household were preferred as the main respondents for adult members 18 years and older of the household, while mothers were preferred as the main respondents for children. A household member was defined as a member living in the same house, including domestic helpers, sharing meals and information for at least 6 months, or intending to stay in the household for 6 months. Written informed consent was taken before data collection from each respondent. Data were collected and entered on handheld tablets using a custom data entry program. Once saved to the device, the data is uploaded to a server. The uploaded data was validated and exported to statistical software for analysis.

Data analysis

Descriptive statistical analysis was done to estimate the counts, frequencies, rates at 95% CI of fatal violence by different socio-demographic variables such as age categories, gender, residence, occupation, educational level, and socioeconomic status. The 95% CIs for categories under each socio-demographic variable were compared to assess statistical significance. Interpersonal violence death rates were reported per 100,000 populations. Binary logistic regression analysis was used to measure the association between the dependent (fatal violence) and independent (gender, area and socio-economic status) (variables using an adjusted and unadjusted odds ratio. Statistical analyses were completed with Stata 14 I/C package. All methods were carried out in accordance with relevant guidelines.

5 to 17 years of age, and about 66.3% were adults (18 years and over). Overall (22.4%) of the population had no formal education; however, around 59.2% of the respondents had received at least primary or secondary education and 9% of the respondents completed higher-secondary and above. About 10.8 % of the respondents were

involved in agricultural activities, 7.9% were in business (traders), 8.1% were skilled labor, 2.4% were rickshaw or bus transport workers, 25.6 % were students and 35.1% were unskilled or domestic, retired unemployed or home maker. Considering the SES index, the population was divided into quintiles and the proportion of population in each category of socio-economic status (SES) index was almost the same, ranging between 19.2% and 20.4%.

Violence was found to be the sixth leading cause of death, which equates to 6% of total injury deaths in Bangladesh (Table 1). Of the total deaths due to violence, 91.7% were male and the remaining 8.3% were female. About 50.0% of the victims that died were in low socio-economic conditions. About 42.0% of the victims' monthly household income was less than $100, about one-third (33.0%) of the households had a monthly income between $100 and $200, and only one-quarter (25.0%) of the households' monthly income was more than $200. More than 50% of people who died due to violence had at least a secondary level of education, one-third (33.0%) had primary education, and only about 8% had no education. Transport workers had the highest proportion (25.0%) of deaths in comparison to other occupations. About 20% of the victims' occupations were businesses, 17% were agriculture workers, and about 15% were engaged in jobs. The other professions of the homicides were students, unskilled or domestic workers, retired, unemployed, and homemaker.

Considering the overall incidence rate, it is estimated that about 6,475 people die due to violence every year in Bangladesh. The overall incidence of death due to violence was found to be 4.0 per 100,000 population per year. The highest death rate due to violence was found in the age group of 20–29 years. It was 7.0 per 100,000, which was followed by 5.6 per 100,000 in the 40–49-year age group (Figure 1).
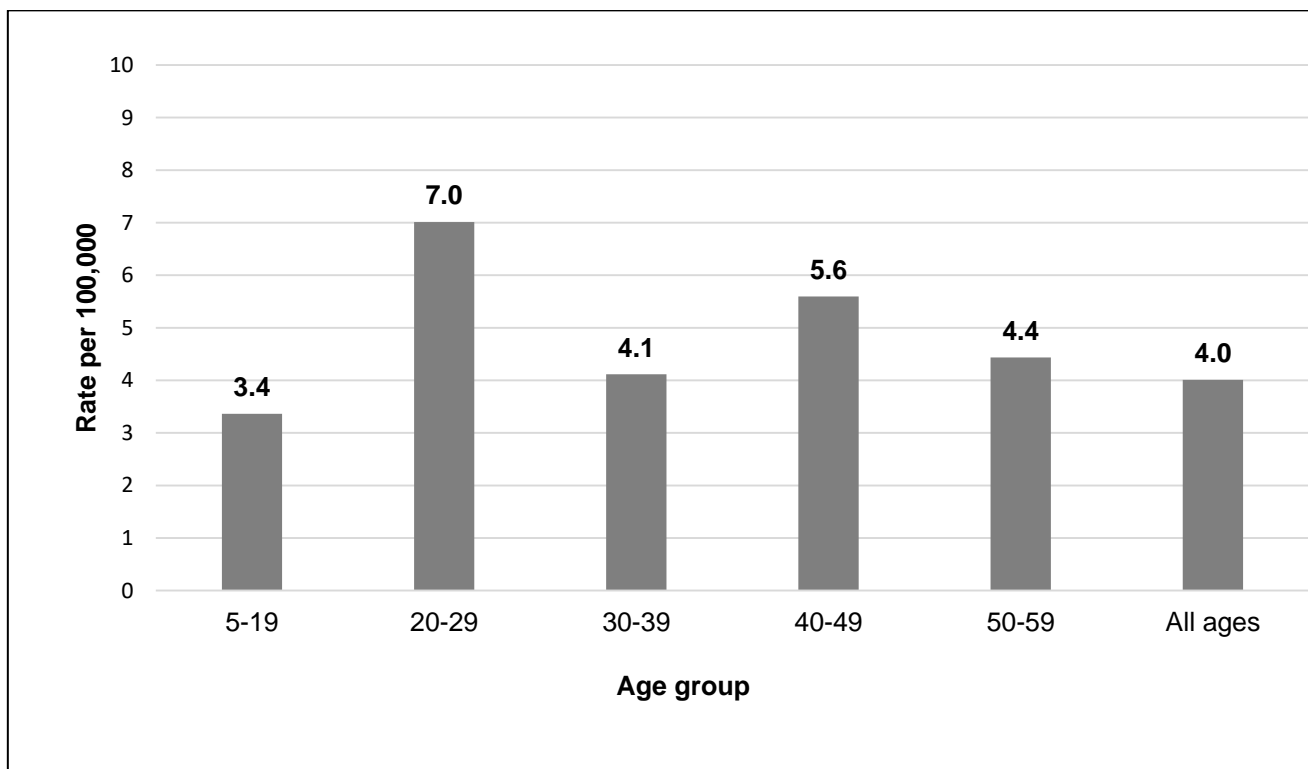

Figure 1: Incidence of death due to interpersonal violence by age (rate per 100,000)

There were no violent deaths among children under the age of five or those aged 60 or older. Among the 030
total of 12 deaths due to violence, there was only one female. The rate was significantly higher in males at 7.3 (95% CI; 4.10–13.13) than females at 0.7 (95% CI; 0.12–3.88). The rate was higher in urban areas compared to rural areas; 5.7 per 100,000 (95% CI; 2.59-12.32) vs 3.1(1.43-6.78) per 100,000 population, respectively (Figure 1).
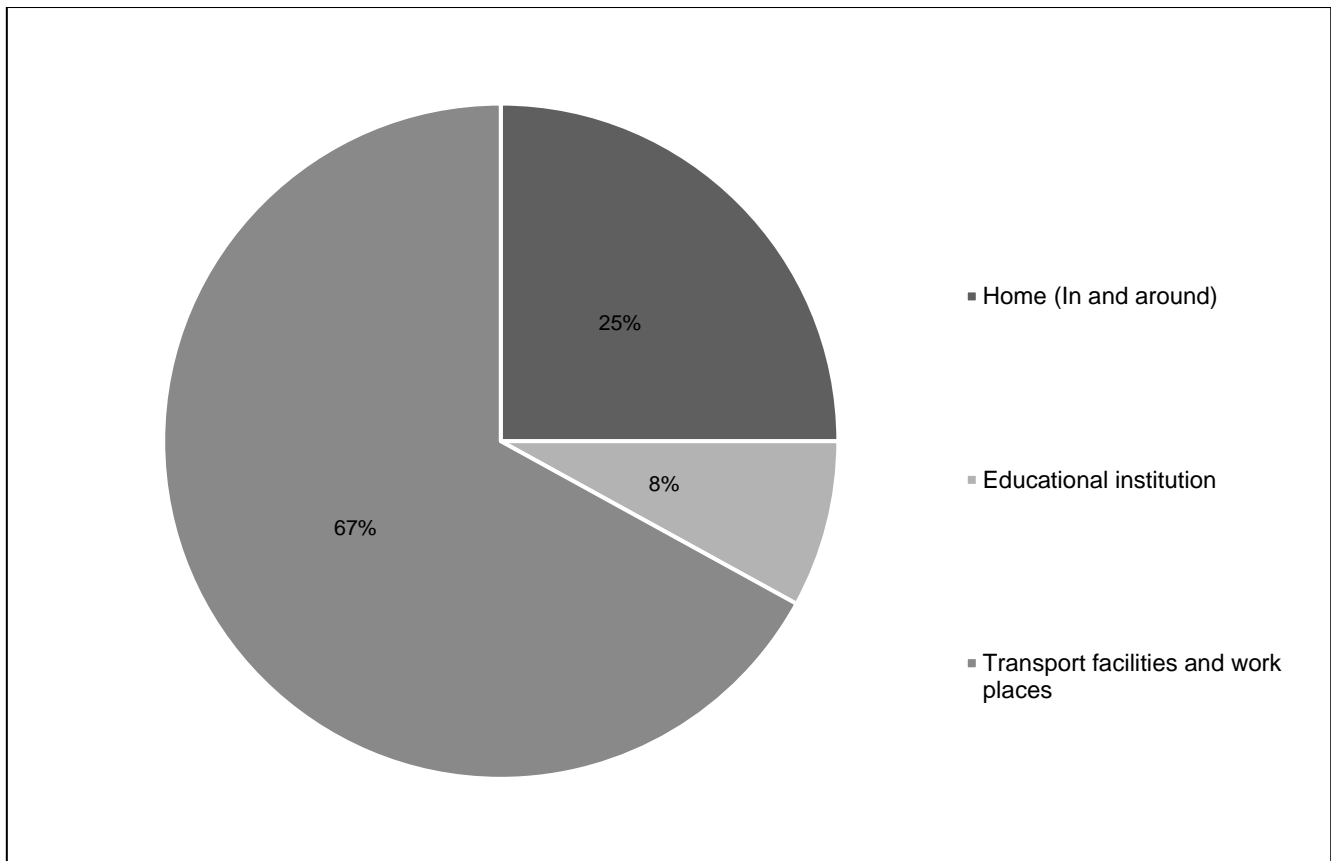
Figure 2: Incidence of fatal violence related injury occurred by place

Around 25% of violence-related deaths happen within the home, whereas 8.3% occur outside. Approximately 66.7% of the incidents occurred in transportation or at work (Figure 2).
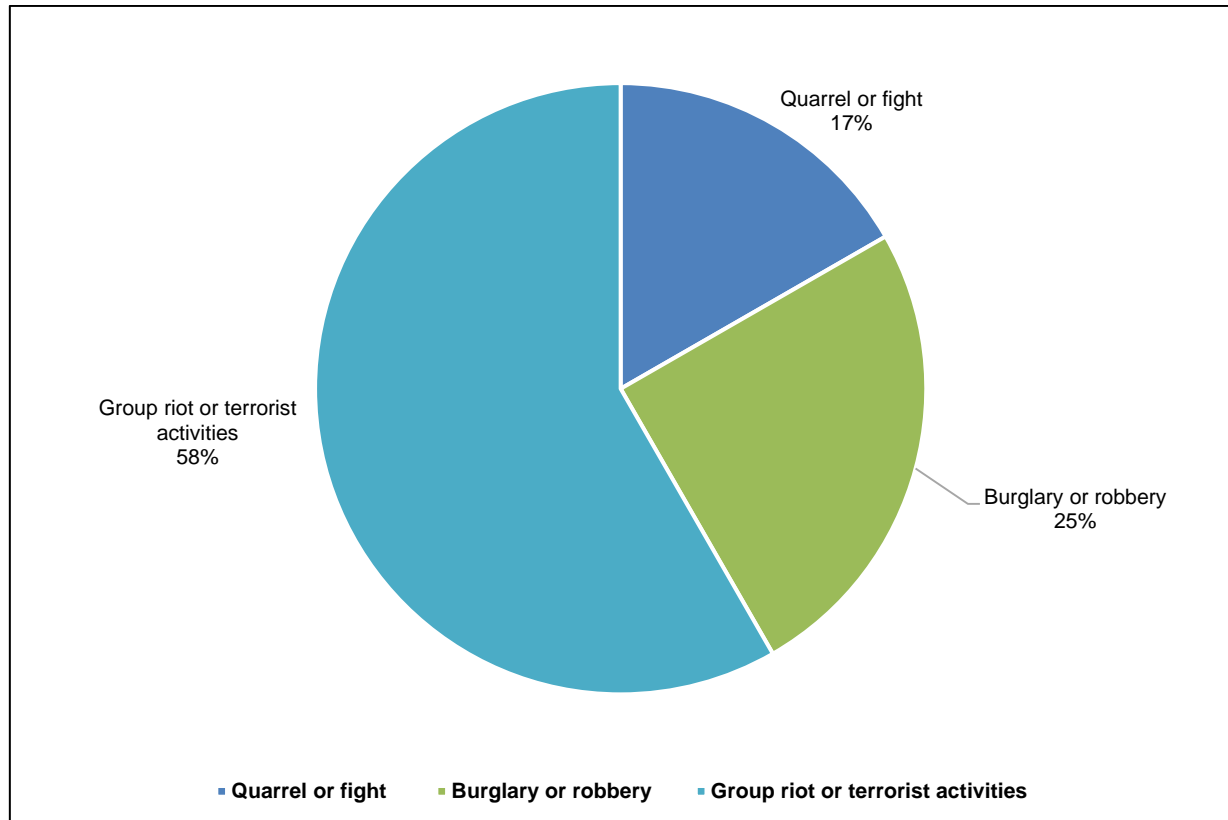

Figure 3: Context of violence

About 25% of violent cases were found due to burglary or robbery, 58% of cases due to group riots or other terrorist activities, and 17% of cases were reported due to domestic violence (Figure 3).
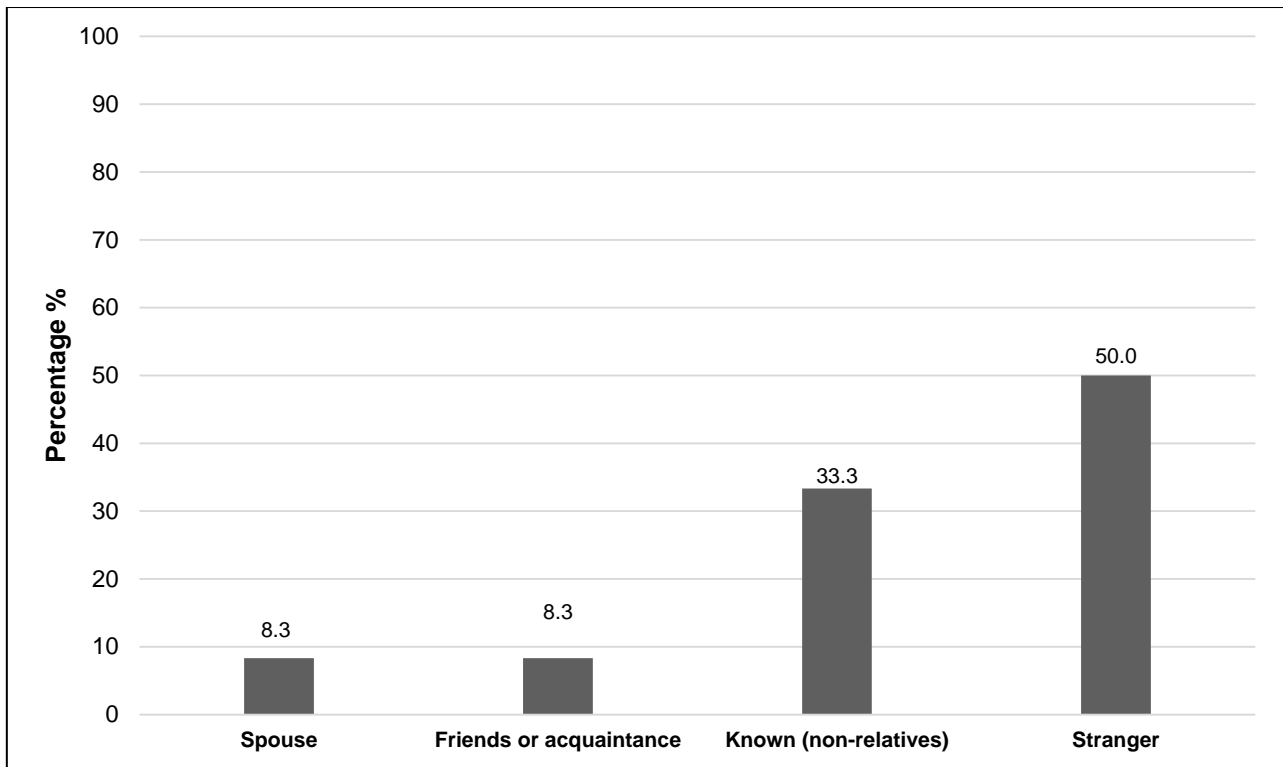
Figure 4: Distribution of perpetrators by relationship

Half of the perpetrators were strangers, and over one third (33.3%) of the cases were known non-relatives. Equal proportions of perpetrators were spouse and friends or acquaintance, which was 8.3% each (Figure 4).
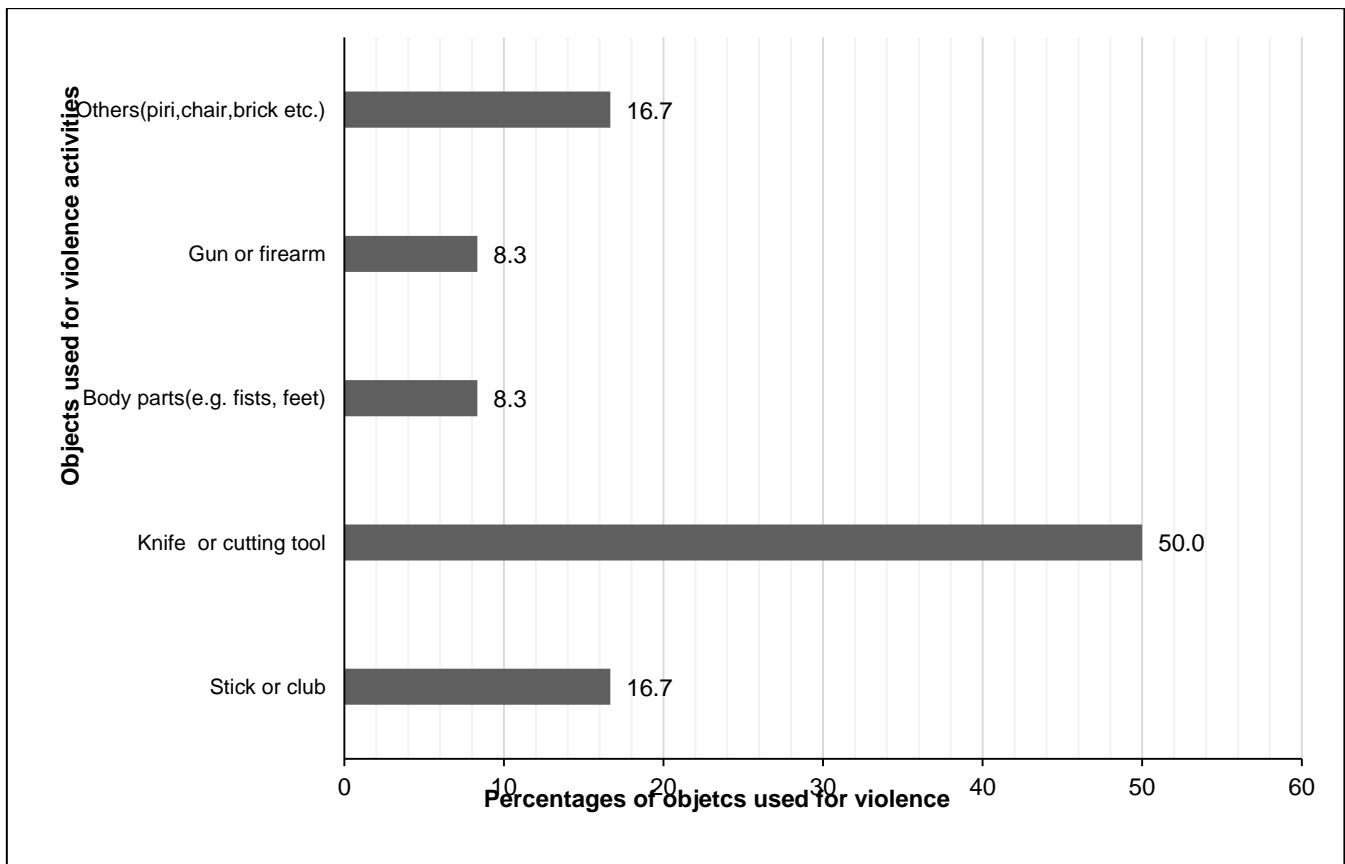

Figure 5: Distribution objects used in violent activities

In half of the reported cases, knife or cutting tools were used for violence events. Moreover, stick/club was reported in 16.7% cases, and gun or other firearms were used in 8.3% cases for interpersonal violence (Figure 5).

Table 1: Distribution of injury mortality by rank

Rank	Injury types	*n*	Rate (95% CI)
1st	Suicide	44	14.7 (11.0-19.7)
2nd	Road traffic injuries	43	14.4 (10.7-19.4)
3rd	Drowning	35	11.7 (6.4-16.3)
4th	Fall	28	9.4 (6.5-13.5)
5th	Electrocution	17	5.7 (3.5-9.1)
6th	Violence	12	4.0 (2.3-7.0)
7th	Animal bite injury	6	2.0 (0.9-4.4)
8th	Burn	5	1.7 (0.7-3.9)
9th	Unintentional poisoning	5	1.7 (0.7-3.9)
10th	blunt object	3	1.0 (0.4-3.0)
11th	Cut injury	1	0.4 (0.06-1.9)
12th	Machine injury	1	0.4 (0.06-1.9)
	All	200	66.8 (58.2-76.8)

Table 02: Association between socio-demographic factors and fatal violence events

Characteristics	B	S. E	OR (95%CI) unadjusted	*P* value	B	S. E	OR (95%CI) adjusted	*P* value
Sex								
Male	2.39	1.04	10.9 (1.41-84.77)	0.02	2.39	1.04	11.0 (1.41-84.84)	0.02
Female	-	-	1	-	-	-	-	-
Residence								
Urban	0.61	0.56	1.8 (0.59-5.63)	0.30	0.77	0.59	2.2 (0.69-6.82)	0.19
Rural	-	-	1	-	-	-	-	-
Socioeconomic status								
Poor	1.13	0.82	3.1 (0.63-15.38)	0.17	1.29	0.83	3.6 (0.72-18.35)	0.12
Middle	0.69	0.87	2.0 (0.37-10.90)	0.43	0.88	0.88	2.42 (0.43-13.55)	0.31
Rich	-	-	1	-	-	-	-	-

Multiple logistic regression analysis revealed that men were 11.0 times more at risk of fatal violence (95% CI 1.41-84.84; *p*= 0.02) than females (Table 2). An association was found between geographic location and fatal violence in crude or adjusted analyses (1.8; 95%CI: 0.59–5.63; *p*= 0.30; and 2.2; 95% CI: 0.69–6.82; *p*= 0.09). However, they were not statistically significant. The violence was found to be 3.6 times higher (adjusted OR) in the poor socio-economic group than in the rich people. However, the difference is not statistically significant (*p*= 0.12).

Discussion:

The Bangladesh Health and Injury Survey (BHIS) 2016 covered approximately 299,216 people from about 70,000 households in 16 districts, which were randomly selected among 64 districts. This data nationally represents one of the single largest population-based injury surveys for all age groups in LMICs. Other large population-based injury studies, including the 2003 Bangladesh Health and Injury Survey (BHIS; 820 347 people from 171,366 households) (13), the 2003 Philippines National Injury Survey (450,000 people from 95,000 households), and the 2004 Thailand National Injury Survey (400,000 people from 101,179 households), were not as large and focused mainly on children aged 0–17 years, except for the 2003 BHIS (13). Hence, another survey revealed the burden and pattern of fatal injuries for all ages in rural Bangladesh (23, 24).

It is estimated that about 6% of people die due to injury violence every year in Bangladesh, resulting in a mortality rate of 4 per 100,000 yearly, which is the 6th leading cause of injury death. This study's findings were similar to those of a study conducted in a similar context in Bangladesh, where the percentage of deaths was 7% and it was the fifth leading cause of violence-related death. However, the violent death rate was found to be much higher in Tanzania (12.5) and other African countries (22) and much lower in the USA (0.2) per 100,000 population (25). An excessively higher rate was found in Iraq (37.3), which was about 10 times higher than in Bangladesh (26). The reasoning behind this could be due to the war situation in the country. In the study, it was found that the majority of violence-related deaths occurred among the age groups of 20–29 and 40–49 years. This age group was also found to be the most vulnerable in another study where most death cases were reported at the age between 40 and 49 years (2). In the USA, homicide is the third leading cause of death for 10-to 24-year-olds and the leading cause of death for male and female African Americans aged 10–34 years (27). There is also another close finding reported in Sub-Saharan Africa where violent-related deaths peak among males aged 15–24 years (28).

The study indicated that compared to females, a significantly (P = 0.02) higher rate of interpersonal violence was prevalent among males. A similar pattern of gender distribution was found in previous studies done in Bangladesh, India, and Tanzania (2, 29, 30). The scenario was found to be the opposite in the USA and China, where the rate among females was found to be significantly higher compared to males (25, 30).

This study found that in the majority of cases, 58.3% of the cases, the context of violence was group riot, followed by 37.7% of domestic violence, and 25.0% of deaths due to robbery/burglary. On the other hand, another study done in Bangladesh found more than half (52.0%) robbery/burglary and 48.0% quarrel and fight (13). A similar context was observed in Tanzania, where robbery/burglary was the context in approximately 54.0% of the cases (29).

In the context of quarreling and fighting, the perpetrators were strangers, relatives, and nonrelatives. In 50% of cases, knives or other sharp-cutting weapons were the objects used in violence. In about 25% of cases, the objects were guns or other firearms, followed by 16.7% of sticks/clubs. Almost similar patterns of object use are found in Africa (29). In the USA, the majority of the objects used in violent death were firearms and sharp-cutting weapons (25).

In terms of domestic violence, women were more affected by violence than men, especially by their

partners in LMICs including in Bangladesh (5, 7, 8, 31). Additionally, about a quarter of the victim's family members sustained injuries while attempting to protect their daughter from an attack. The most common reasons behind this scenario were dowry and personality conflicts with the in-laws (8).

Previously, it was evident that poverty was a triggering factor for violence (32). In Bangladesh, it was found that the majority lived with a poor income and fought or quarreled at the interpersonal level. Such interpersonal violence results in different types of violence (9, 31). Further, the study could be interesting to explore both victims (including relatives) and perpetrators' attitudes toward poverty and other socio-economic issues. In the violence cases, law enforcement agencies became involved and, for the fatal cases, bodies needed postmortem examinations. To avoid the postmortem procedure, the family members tried to hide the reason of deaths. Due to that, violence cases might be under reported. Another limitation is that respondent's reluctance to answer openly on abuse due to emotional bias. Violence is one of the major public health and social issues which deserves immediate attention to reduce death, morbidities, and disabilities. Further studies are highly warranted for identifying risk factors and to assigning causality by further cross sectional and longitudinal studies.

Conclusion:

Interpersonal violence was a major cause of death in Bangladesh. Males and urban people were the most vulnerable groups. Transport facilities and workplaces were the most common places for violent fatalities. Knives or other cutting tools, sticks, or clubs were used as objects of violence. Strangers, known or not relatives, friends, or acquaintances, are the most frequent perpetrators. Violence is a public health problem that requires amendment and modification of the current policies and also appropriate interventions by the relevant government and non-government agencies to reduce unwanted deaths in Bangladesh. The government can amend the current laws to make transport facilities and workplaces safer. Employers can also take the initiative to recruit mental health support and also provide proper orientation on the policies and current laws of the government and organizations. The policy regarding the carrying and using of knives and sharp objects should also be amended and implemented by law enforcement agencies. The government and private organizations need to engage young adults by involving them in vocational-based jobs. In addition to all these, a public awareness campaign needs to be carried out in collaboration with public, private, and development organizations.

Abbreviations

World Health Organization (WHO)
low-and middle –income countries (LMCs)
Bangladesh Health and Injury Survey (BHIS) 2016
Static Metropolitan Area (SMA)
Socio-Economic Status (SES) index
Odds ratio (OR)
United States of America (USA)
Non-Communicable Disease Control Programme (NCDC)
Directorate General of Health Services (DGHS)
Ministry of Health and Family Welfare (MOHFW)
Ethical Review Committee (ERC)
Centre for Injury Prevention and Research Bangladesh (CIPRB)

Ethical statements

Ethical clearance was obtained from the Ethical Review Committee (ERC) of Centre for Injury Prevention and Research Bangladesh (CIPRB) for this nation-wide survey (ERC no.: CIPRB/ERC/2016/005). Written informed consent was obtained from each respondent.

Funding information

Conflicts of Interest

The authors declare no conflict of interest.

Author Contributions

Md Abu Talab and Md. Al-Amin Bhuiyan conceptualized, analyzed data, interpreted results and wrote original draft. Md. Al-Amin Bhuiyan, Md Shafkat Hossain, Zobear Alam, Shagoofa Rakhshanda interpreted the data and wrote original draft. Aminur Rahman designed the study, oversaw the quality control measures and reviewed the manuscript. Salim Mahmud Chowdhury implemented the study and wrote the manuscript. AKM Fazlur Rahman designed the study, supported in data analysis and contributed to the manuscript. Saidur Rahman Mashreky supervised in writing manuscript, conceptualized and critically reviewed.

Consent for publication

Not Applicable.

Availability of data and materials

The data sets that support the findings of this study are available on request from the corresponding author. The data is not publicly available due to privacy.

Acknowledgements

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