

# Incidence of Injuries in Bhagawanpur, Siraha District, Nepal: a Door-to-Door Survey

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## Abstract

**Background:** Rapid industrialization, increasing traffic hazards, and the hectic pace of modern life have exposed people to a greater risk of accidental injuries. We aimed to document the incidence of injuries in the Bhagawanpur Rural Municipality of Siraha District of Nepal and their pattern and cost of treatment.

**Methods:** This cross-sectional study involved 12,935 participants in Bhagawanpur Rural Municipality. A door-to-door survey was conducted from June to August 2018 by face-to-face interview using a preformed semi-structured questionnaire designed for this study. The households were selected by probability proportion to size method from each ward. The variables included the number of injuries, patterns, and costs of treatment.

**Results:** The incidence of injury was 5.3%. The majority (36.2%) belonged to the age group of 16-30 years. The fall injury occurred in 54.2% and superficial bruises affected 70% of injury. Minor injury contributed to about 89.8% and major injury was seen among 10.2% of the study participants. More than half (56%) of the individuals spent less than NPR 1500.00 for the treatment.

**Conclusion:** The incidence of injury was 5.3% among people living in Bhagawanpur Rural Municipality of Siraha District. Most of them were young, and had minor injuries. Treatment costs for most of the injuries were less than NPR 1500.00.

**Keywords:** Bruises; Fractures; Injury; Major; Minor

## Declarations

**Ethics approval and consent to participate:** Ethical approval from Institutional Review Committee, B. P. Koirala Institute of Health Sciences (IRC No. 1192/074/075) and consent to participate was taken from all participants.

**Consent for publication:** Informed consent was taken from all participants.

**Availability of data and materials:** The full data set supporting this research can be made available on request to the author.

**Competing interest:** None

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Any event like injury that causes ill health for a large number of people in a population is a public health problem. [1]. Injury is one of the leading causes of disability and death [2]. The World Health Organization predicts that by the year 2020, trauma is going to be the primary or second leading cause of years of life lost for the world's population [3]. The information received from the injuries surveillance helps to understand the extent of the problem, patterns of injury, population at risk, and compare the problem among and within geographical areas which may help in creating awareness and future planning [4].

Bhagawanpur is one of the rural municipalities in Siraha District. However, the incidence of injury and its pattern in the Siraha District remains unexplored. Hence, we aimed to document the incidence of injury in Bhagawanpur Rural Municipality of Siraha District in Nepal.

## METHODS

A descriptive cross-sectional study was carried out in Bhagawanpur Rural Municipality of Siraha District, for a period of 3 months from June to August 2018. Different wards were selected as per the feasibility of the researchers. Using the convenience sampling technique, a total of 12,935 members of the Bhagawanpur Rural Municipality of Siraha District were enrolled. A pre-tested semi-structured questionnaire designed for this study was used for data collection by trained enumerators. Face-to-face interview was used. Variables recorded included demographic parameters, types and pattern of injury that occurred within one year, and the related treatment cost. For purpose of the study, occupation of age < 10 years was considered as not applicable. A minor injury was defined as an injury that resulted in a disability for less than a month. A major injury was defined as an injury that resulted in a disability lasting more than a month. Any report of death related to injury within one year was noted, although this was not included in the total number of sample. Death due to any other cause was not noted.

Ethical approval was obtained from the Institutional Review Committee, B. P. Koirala Institute of Health Sciences, Dharan, Nepal before the study began. Written informed consent was obtained prior to enrollment. Confidentiality of the information was maintained. Neither any incentive nor any pressure or threat was given to the participants.

The sample size was calculated on the basis of

a previous study which reported the total prevalence (minor and/ or major) of injury as 3.0% in a rural area of Nepal [5]. Considering 95% CI, 80% power and the margin of error as 10% of the prevalence, a sample size of 12935 was estimated. The collected data was reviewed and edited on the same day of collection by the principal and co-investigator to detect errors. It was further corrected after verification with source documents. Coding was done by assigning the number to the responses. The collected data were entered into Microsoft Excel 2007 and analyzed using SPSS version 11.5. Categorical variables were described as frequency and percentage and normally distributed continuous data were described as mean, and standard deviation. For inferential statistics, the chi-square was used to find the association between two categorical variables, and a significant level was considered at p-value < 0.05.

## RESULTS

Among 12,935 members interviewed, 5.3% (686 members) reported at least one type of injury. The majority belonged to the age group 16-30 years (36.2%), and Madhesi ethnicity (67%). Fall was the most common cause of injury (54.2%) followed by hit by a person or object/ stuck (13.8%). The majority suffered from superficial bruises (75.0%) followed by cut/ bite / open wounds (44.7%). The majority had an injury at home (33.3%) (**Table 1**). While the majority (94.6%) reported no injury, only 0.5% reported major injuries and 4.7% reported minor injuries. The mean age of people suffering from major injury was  $21.7 \pm 17.5$  years and minor injury was  $22.9 \pm 18.8$  years.

The cost (mean  $\pm$  SD) for the treatment was NPR 2,284.69  $\pm$  1284.67 and 58% spent less than NPR 1500.00. Among the victims of major injuries, 61.4% reported to have spent more than NPR 1500.00, whereas only 43.7% suffering minor injuries spent more than NPR 1500.00 for treatment (p = 0.005) (**Table 2**). Twenty-one cases of death due to injury was reported in the duration of one year.

## DISCUSSION

In this study, the incidence of injury in Bhagawanpur Rural Municipality was 5.3% and the majority had only superficial bruises. The incidence of minor injury among the rural community of Aurabani Village Development Committee of Sunsari District has been reported as 3.1% which is a little less than the 4.7%

**Table 1: Socio-demographic and injury profile of injured population (N = 686). Values are presented as number (%).**

Variables	Frequency	
Age (y) (mean $\pm$ SD = 27.74 $\pm$ 16.21)	1 - 15	156 (22.7)
	16 - 30	248 (36.2)
	31 - 45	197 (28.7)
	46 - 60	49 (7.1)
	61 above	36 (5.2)
Gender	Male	372 (54.2)
	Female	314 (48.8)
Occupation	Agriculture works	122(27.2)
	Student	93(20.7)
	Housemaker	87(19.4)
	Laborer	81(18.1)
	Others	65(14.5)
Nature of Injury*	Fall	372(54.2)
	Stuck/ hit by a person or objects	95(13.8)
	Agricultural works	94(13.7)
	Electric shock/burn	84(12.2)
	Cut by a sharp instrument	58(8.4)
	Animal bites	30(4.3)
	Gunshots	11(1.6)
	Poisoning	8(1.1)
Types of Injury*	Bruise superficial	515(75)
	Cut/ bite/ open wound	307(44.7)
	Sprain/ strain	240(34.9)
	Burn	30(4.3)
	Fracture/ dislocations	25 (3.6)
	Others	13(1.8)
Place of injury	At Home	229(33.3)
	At Farm	207(30.1)
	On the road to the village/ town	187(27.2)
	At industry	50(7.2)
	Public place/office	13(1.8)

\* multiple-choice,  $\neq$  100%

**Table 2: Treatment Cost Distribution by Type of Injury. Values are presented as number (%).**

Costs categories	Type of Injury	
	Major (n = 70)	Minor (n = 616)
$\leq$ 1500 NPR (n = 374)	27 ( 38.6)	347 ( 56.3)
> 1500 NPR (n = 312)	43 (61.4)	269( 43.7)

$\chi^2=7.996$   $df=1$ ,  $p$ -value= 0.005

reported in our study [6].

We found the highest incidence of injury (36.2%) among the age group of 16 - 30 years followed by 31 - 45

years (28.7%). The mean age of the injured people was 27.7 years. A similar study in Haryana, India reported the maximum incidence of injuries in the 25 - 34 years age group [7]. Similarly, a study done in Makwanpur district of Nepal showed that the most commonly injured group belonged to the age group of 25 - 40 years [8].

We found that the incidence of injury was more common in people who had agriculture as their major occupation. We also found that the majority of injury was bruise wounds (75%) probably because the major population in the village have manual work such as cutting grass, crops, or bamboo with a sickle or other homemade instruments. Perhaps most people did have access to injury protection tools. Our finding correlates with another study which reported the most common injury as cuts and bruises [5].

The frequency of injuries occurring at home and in agricultural farms was 33.15% and 30.1% respectively. Another study from Nepal showed that 64.5% injury occurred either at home or at work [8]. This might be because many families living in rural Nepal keep their own livestock and grow their own food. Additionally, many people are engaged in field-related work in rural areas. In relation to agricultural injuries, the findings of our study is similar to another study in Nepalese farmers [9]. The costs incurred for treatment of major injuries in our study was significantly higher than that for minor injuries. Reports from elsewhere are consistent with our results [10, 11].

Our study has some limitations. We used a recall period of one year allowing for a recall bias. Since we did not analyze the injury of people who had died, we might have missed important causative factors for severe life threatening injury.

## CONCLUSION

The overall incidence of injury was 5.3%, with major injury being 0.5% and minor injury 4.7%. Injury occurred mostly in 16 - 30 years age group. Fall was the most common cause and the majority suffered from superficial bruises. More than half of the injured persons spent less than NPR 1500.00 for treatment.

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