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ORIGINAL RESEARCH ARTICLE

Prevalence of Injuries amongst the People of Sonapur Village Development Committee, Eastern Nepal

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ABSTRACT

The prevalence of injuries amongst the people in a rural community of eastern, Nepal, at Sonapur village was studied. The prevalence rate of minor injury was found to be 2.9 % per month and for major injury was 0.04 % per year. The mean age of the injured person for minor injuries was 22.3 years and for major injuries was 42.7 years. Male injured persons were nearly double than females. Factory employees, students and farmers were more common amongst the injured persons. Agricultural farm was the place where most of the injuries took place. Roads and playgrounds were the second leading place for the injuries. Among the transport related injuries, the most common cause of injury was amongst the bicycle riders. The 82.8 % of people using bicycle were found to be injured. Incised wound (29.5%), bruise or contusions (26.8 %) were the commonest types of external injuries observed during the study.

Key words: Injury, factory employees, school children, farmers.

INTRODUCTION

Injuries are a focus of public health practice as they pose a serious health threat to the people. It can occur frequently amongst the people of all ages. However, most injuries are preventable. Injury ranges from minor cuts and bruises to major catastrophes. Some injuries may result in prolonged pain or life-long disabilities that restrict an individual from performing personal and work related activities. Thus, the reduction in the number and severity of injuries offers a cost-effective manner which improves the health status of populations [1].

Rapid industrialization, increasing traffic hazards, and hectic pace of modern life have exposed people to greater risk of accidental injuries, incapacitation, and death. Accidents are largely attributed to lack of awareness about potential hazards in home, place of work, factory, or even recreation facilities. Besides these, human factor of neglect, carelessness, technical imperfection of the machines, and lack of proper safeguards are other contributory factors [2].

Injury is the leading cause of years of life lost in most industrialized nations [3,4]. Similar trends are occurring in developing nations. In the less economically advanced developing nations, such as Africa and South Asia, infectious diseases still predominate as the leading cause of death. However, even there, infectious diseases are declining, whereas trauma related mortality is increasing. The World Health Organization predicts that by the year 2020, trauma will be the first or second leading cause of years of life lost for the entire world's population including both developed and developing nations. In the United States and other developed nations, trauma mortality has gradually decreased in recent decades, primarily due to injury prevention efforts and the development of more advanced trauma treatment systems. Similar prevention and treatment efforts are still at a rudimentary level in most developing nations [5].

Development of effective injury prevention efforts depends on reliable information on the incidence and outcome of specific mechanisms of injury. In high-income countries, such data usually come from vital statistics registries and from health care records. In low- income countries, such source of data is of limited value. Many deaths are never reported to the government and information on cause of death is limited and unreliable, while

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many ill or injured persons never receive formal medical care, making health care records an incomplete source of data [4,6,7]. The injury problem has been very different in Nepal due to the mountainous and Terai regions of the country. As per the annual report of the Department of Health Services, falls, burns and scalds and dog bites were reported in large numbers. Injuries contributed for 2% of the hospital admissions occupying the tenth leading position in Nepal [8].

The aim of the current study is to provide community based prevalence of injuries in rural community of eastern Nepal. By doing so, this study hopes to provide information that would be useful for the development of realistic and effective injury prevention efforts, aimed at those mechanisms of injury that leads to the larger burdens to the society.

MATERIALS AND METHODS

Sampling method and Sample size:

Out of 49 VDCs in Sunsari, Sonapur VDC, consisted of 10,330 populations with 2,284 households [10], was selected using random sampling technique. Sonapur Village Development Committee lies in Sunsari district of eastern Nepal. All the households in the village were included in the study. The respondents who disagreed to take part in the study and those whose house was locked even in the second visit were excluded from the study. So, the ultimate sample reached to the size of 10,220 persons from 2,264 households.

Data Collection Tools:

A questionnaire was designed to collect the information which consisted of demographic information regarding caste, age, gender, education and occupation; circumstances of injury sustained, injuries sustained by occupation, place of injury, types of injuries etc.

Analysis of Results:

The collected data were entered in computer using MS excel. Analysis was carried out using statistical software SPSS 17.0. The frequency and percentage were calculated. The Chi-square test was applied to know the significance of the variables.

RESULTS

Prevalence of injuries amongst total population of Sonapur VDC:

(Table 1) shows that out of the 10,220 population, 302 persons had injuries, in which minor injuries were 298 (2.9%) during the preceding recall of one month and major injuries 4 (0.1%) were reported during the preceding recall of one year. As the major injuries were found to be very less in comparison with total population taken, only minor injuries are taken into consideration in further analysis.

(Table 2) shows the prevalence of injuries based on age group. It indicates that the prevalence of injuries among 10 – 19 years of age group is 4.2%, followed by 30 – 39 years age group (3.3%). The age groups of the respondents have statistically significant relation in occurrence of minor injuries ($\chi2 = 13.438$, df = 4, $p<0.01$). Males (3.7%) were majority of people involved in injury than females (2.2%). It was observed that there is a significant difference between the prevalence of minor injuries and gender distribution (($\chi2 = 20.49$, df = 1, $p<0.001$). The most common injuries were occurred with educational background of high school (4.6%) followed by primary school (3.6%). Persons with a higher education (above high school) were fewer in proportion. There was significant role of occurrence of minor injury and education status of respondents (($\chi2 = 14.05$, df = 4, $p<0.008$).

Prevalence of injuries by occupation:

The occupation of the population of Sonapur VDC is tabulated in (**Table 3)**. It showed that the prevalence of minor injuries was highest among the factory employees (4.7%). Students were the next largest group with 4.1% followed by agriculturists.

Marital status of minor injured persons:

The percentage of injured persons was calculated depending upon the marital status. The (**Fig 1)** shows that 55% of the total injured persons were unmarried and 45% were married.

The alcohol consumption is also one of the factors which can trigger for accidents. The habits of alcohol consumption, smoking, chewing tobacco were studied among the injured persons. (**Table 4)** indicates that out of the total injured persons, smokers and tobacco chewers were 15.2% and 12.8% respectively among injured persons. The results in **Table 4** informed that out of the total injured persons 75.1% were not using anything, 15.2% were smoker and 12.8% were tobacco chewers, 7.7% were drinkers. (**Table 5)** shows the persons that got injured after having alcohol. The data showed that only 7.5% among injured people had consumed alcohol prior to injury. (**Table 6)** showed the percentage of injury according to their work place. The data indicated that among the total minor injured person, 28.9 % were in the agricultural farm followed by 20.8 % in road and play ground.

In rural areas, road condition is worst as there is lack of pitched roads. In rainy and other seasons also, people get trouble during walking or using bicycles or motor bikes or using tractors that may lead to minor or major injuries. In relation to these facts, this research also tried to find out injury due to transport related mechanism of injury. (**Table 7)** shows transport related mechanism of injury sustained

The results showed that among the total injury occurred the highest transport related injuries were bicycle (8.1%) followed by motor vehicle crash (0.7%), which shows the main mode of transportation was bicycle.

In **(Table 8),** it has been clearly seen that the percentage of incised wound is highest 29.5%, followed by bruise or contusion 26.8 % and abrasions 22.5 %.

Table 1: Prevalence of injuries among total population of Sonapur VDC

S. No	Injuries	Frequency	Percentage	Mean Age ± SD
1	Minor*	298	2.91	22.32 ±14.25
2	Major**	4	0.04	42.75 ± 2.22
3	Not injured	9918	97.04	22.80 ± 17.02
	Total	10220	100	22.80 ± 16.96

**per month, **per year*

Table 2: Prevalence of injuries by age, gender & educational status

		Minor n=298 (2.9%)	Not Injured n=9918(97.1%)	T. Population n=10216(100%)
Age group	0-9 years	64 (2.0%)	3062 (98.0%)	3126 (30.6%)
	10-19 years	93 (4.2%)	2142 (95.8%)	2135(21.9%)
	20-29 years	62 (3.1 %)	1919 (96.9%)	1981 (19.4%)
	30-39 years	49 (3.3%)	1430 (96.7%)	1479 (14.5%)
	40-49 years	20 (2.9%)	664 (97.1%)	684 (6.7%)
	≥60 years	10 (1.4%)	701 (98.6%)	711 (6.9%)
Sex	Male	190 (3.7%)	5004 (96.3%)	5194 (50.8%)
	Female	108 (2.2%)	4914 (97.8%)	5022 (49.2%)
Education	Illiterate	139 (2.5%)	5367 (97.5%)	5506 (53.9%)
	Just literate	44 (2.7%)	1579 (97.3%)	1623 (15.9%)
	Primary School	74 (3.6%)	1999 (96.4 %)	2073 (20.3%)
	High school	34 (4.6%)	702 (95.4%)	736 (7.2%)
	> High school	7 (2.5%)	271 (97.5%)	278 (2.7%)

Table 3: Prevalence of injuries by occupation

		Minor n=298 (2.9%)	Not Injured n=9918 (97.1%)	T. Population n=10216(100%)
Occupation	House wife	51 (2.2%)	2280 (97.8%)	2331 (22.8%)
	Agriculturist	25 (3.6%)	670 (96.4%)	695 (6.8%)
	Laborer	44 (3.5%)	1196 (96.5%)	1240 (12.1%)
	Students	93 (4.1%)	2196 (96.1%)	2289 (22.4%)
	Govt. Service	1 (0.5%)	218 (99.5%)	219 (2.1%)
	Business	6 (3.0%)	192 (97.0%)	198 (1.9%)
	Factory employee	26 (4.7%)	527 (95.3%)	553 (5.4%)
	Unemployed	2 (1.6%)	127 (98.4%)	129 (1.3%)
	Not applicable	44 (1.9%)	2259 (98.1%)	2303 (22.5%)
	Others	6 (2.3%)	253 (97.96%)	259 (2.5%)

Table 4: Distribution of smoking, chewing tobacco and consumption of alcohol among injured person

Category label	Frequency	Percent
Smoking	45	15.2
Chewing tobacco	38	12.8
Consumption of alcohol	23	7.7
Not using anything	223	75.1

Table 5: Consumption of alcohol prior to injury

Consumption of alcohol	Frequency	Percent
Yes	2	0.7
No	296	99.3
Total	298	100

Table 6: Place of occurrence of injury

Place	Frequency	Percent
Field/farm	86	28.9
Road	62	20.8
Playground	62	20.8
Home	40	13.4
Factory	36	12.1
Others	12	4.03
Total	298	100

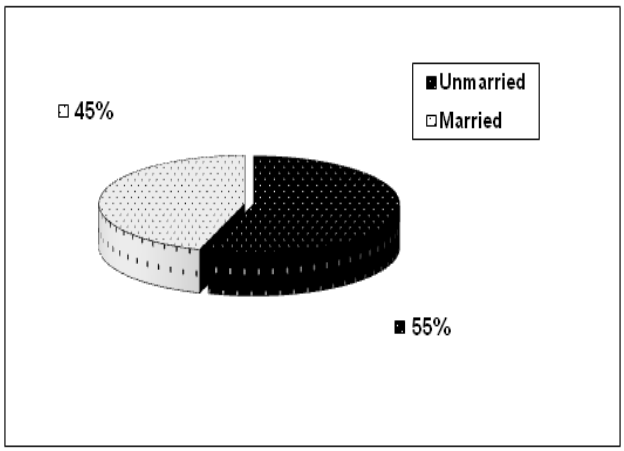
Table 7: Transport related mechanism of injury sustained

Means of transport	Frequency	Percent
Motor vehicle crash	2	0.7
Motorcycle crash	1	0.3
Pedestrian	1	0.3
Bicycle	24	8.1
Tractor	1	0.3
Total	29	9.7

Table 8: Types of external injuries sustained

Types of injuries	Frequency	Percent
Abrasions	67	22.5
Lacerations	19	6.4
Multiple superficial injuries	8	2.7
Multiple deep injuries	2	0.7
Crush injuries	5	1.7
Burn / scald	11	3.7
Incised wound	88	29.5
Punctured wound	15	5.0
Bruise or contusion	80	26.8
Fractured or dislocation of bone	3	1.0

Fig 1: Marital status of minor injured persons (n=298)



DISCUSSION

The aim of this study was to provide information regarding the prevalence of injuries, the various epidemiological factors related to injuries and give advice for prevention of such injuries in a rural community of eastern Nepal.

The present study revealed that prevalence rate of minor injury was 2.9% in one-month recall period and 0.04 % for major injury in one-year recall period in Sonapur VDC. The study done by Mock CN, et al. (1999)[10] showed that the prevalence of minor injury among the rural community of Ghana was 3.1%. The occurrence of minor

injuries in rural community of Ghana and Sunsari district shows similar trend.

The age specific prevalence of minor injury was highest among 10-20 years age group (4.2%) followed by 30-40 years age group (3.3%) and 20-30 years age group (3.1%). The mean age of the injured persons was 22.32 years. Verma P.K. et al (2000) [11] in Hariyana state of India, found maximum incidence in 25 – 34 years age group. Rahman F et al (1998) [12] in Bangladesh, showed mean age for injury as 29.6 years. A study done by Singh S (1996) [13] in eastern Nepal showed 0 – 40 years as most commonly injured group. Similarly Oliver BA and Civera CP (1998) [14], found most prone group for accidents was 5 – 25 years and average age for men for accident was 26.5 years and that for women was 33.1 years.

In the present study, males were injured more (3.7%) than females (2.2%). Similar trends have been observed by Pickett W et al in Ontari [15] of Canada, Ahmed M *et al* (1999) [16] in Pakistan, Oliver BA and Civera CP (1998) [14] in Valencia of Spain, Jha N, *et al* (1998) [17] and Singh S (1996) [13] in eastern Nepal. The finding suggests that injury was more common among men, it may be due to their involvement in outdoor activities; again, women usually don't involve in hard work and busy in light and easier work at home.

The result also showed prevalence was more among the high school students by education (4.6%) than those of primary level students (3.6%). This could be due to high school students being more involve in risky behaviors. Due to these reasons injuries may occur among them.

Injury rate according to occupation was seen highest among the factory employees (4.7%), followed by students (4.1%) and laborers (3.5%). This indicates the lack of security and safe factors in the factories. The factory employees are more vulnerable to have the injuries during their work with machines. This shows that there is need of improvement related to safety measures in this sector.

The number of injuries occurring in the agricultural farm and roadside were 28.9% and 20.8% respectively. It is supported by a study done in rural India by Mohan D (1996)[18]. He has reported a higher incidence of extremities injuries from mechanized agriculture machines in a area where most of the people rely on agriculture. The present study reported that the second leading place of occurrence of injury was on the road (20.8%), it might be due to graveled, small and rough roads in Sonapur village.

Among the transport related injuries, bicycle was highest (82.2%) followed by motor vehicle crash (6.9%). This finding is supported by a study done in rural area of Ghana by Mock CN *et al* (1999). It was also observed that the road in the VDC was very rough due to which bicycle injuries may be more.

This study revealed that occupational injury was more common among agriculture (13.8%) than non-agriculture (9.1%) by major occupation. This study also showed that maximum type of injury was incised wound (29.5%) followed by bruise or contusion (26.8%). This correlates with studies done by Hemmo lotem M *et al* (1996) [19], where he found the commonest injury were cut and bruises (38.8%). The same result was obtained by Kopjar B *et al* (1993) [20] that the commonest type of injury were cut, sting or puncture.

Mock CN. *et al* (2000) [21] showed that most commonest type of injury was laceration which contradicted the finding of this study because the population in the village used to cut grass, crops or bamboos with sickle.

In the present study there were four major injuries reported during the preceding recall of one year. The mean age of major injured person was 42.7 years. The prevalence of major injury was 0.04% out of the total population of 10,220. Comparing these finding with Mock CN *et. al.* (1999) [22], the major injury cases in Sonapur village development committee was very low. This showed that the causative factors for occurrence of major injury in rural area of Ghana might be more than the rural area of Nepal, like Sonapur.

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