

Pattern Of Domestic Injuries In A Rural Area Of India

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Citation

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Abstract

Objective: To study the frequency and type of domestic accidents **Study design:** Prospective Epidemiological study **Participants / Study area:** Rural area of Punjab, India **Methodology :** Frequency of domestic accidents was studied in the participants as per age, sex, mode of injury, category of injury and place of injury **Statistical analysis:** Percentages & Chi-square test **Results:** A total of 300 accidents occurred in one year in the 2825 individuals studied in one year. Incidence density was calculated to be 106.2 accidents per thousand person-years of observation. More accidents occurred in females (173) as compared to males (127). There were 53.2 % Trivial, 27.3% Minor & 11.7% serious accidents. No Fatal accident was reported. 44.3% of accident were reported to be 'fall at level and fall from height'. Maximum (53.3%) accidents occurred in the courtyard.

INTRODUCTION

Unintentional injuries are a major public health problem worldwide. Member-countries of South-East Asia Region (SEAR) are passing through a major epidemiological transition, socio-demographic change & technological revolution during the past two decades. (1) These changes have resulted in an unprecedented upsurge of non-communicable diseases and injuries. Recent progress in industrialisation & use of vehicles, increased number of people living in crowded & unsafe settlements, coupled with inaccessible & unaffordable emergency health services also contribute to the higher health burden of injury in the developing regions of the world. (2) Accidents in the home as causes of injury & death are of great importance - the equivalent in public health terms - of a major epidemic. (3)

It is known that hospital data show only a fraction of the complete picture of physical injuries in a community. (2, 4, 5, 6) Also most of the research, especially hospital based research, has focused on major & fatal injuries. Population-based estimates of the burden of common injuries such as falls, burns and farm/field related injuries are still uncommon. (7) Hence, this population-based study was conducted to estimate the incidence & pattern of domestic injuries in a rural area of Punjab, India.

MATERIAL & METHODS

This was a descriptive prospective epidemiological community-based study carried out in the village Saharan

Majra. It was selected randomly out of a group of ten villages under the rural field practice area of Department of Community Medicine, Dayanand Medical College & Hospital, Ludhiana, Punjab. The entire population of the village consisting of 2825 individuals was studied for one year.

Domestic accident in this study included any unforeseen untoward happening in the house, its compound, up to and including the steps leading to the house.

The entire population of the rural area is closely monitored by female health workers who provide home-based comprehensive healthcare. The health worker of the village made a specific regular enquiry about the occurrence of any accident in the family since their previous visit and reported to the investigator, who then investigated all the accidents personally. During the visit, a pre-tested proforma incorporating the particulars of the family, its dwelling and its surrounding was completed (House-hold characteristics). A second proforma incorporating the details about the accident was also filled up (Individual injury event). The proforma covered accidents occurring in the house such as falls, electric current injuries, cuts and burns during kitchen practice, injuries while playing in the house and any mishap by taking poisons / household products like kerosene oil / medicines / pesticides and any other type of accidents. These parameters were as per International statistical classification of disease and related health Problems (ICD-10). (8) For each accident case a closely matched control was studied.

Accidents outside the home i.e. at the place of work or at school and those which happen to be road traffic accidents were excluded from the study. Guests/visitors who are not the permanent members of the family were not considered in this study.

The severity of accidents was classified as below: (9)

Trivial: Examined but no treatment given.

Minor: Treated and no more treatment required / Referred to G.P / Admitted for < 1 day.

Serious: Admitted for 1 to 3 days.

Very serious: Admitted for >3 days / Transferred to a specialist.

Fatal: All deaths due to accidents.

STATISTICAL ANALYSIS

The data so collected was tabulated and analyzed. Simple descriptives & frequencies were used. The comparison of proportions across groups/categories was carried out by Pearson's Chi-square test. The Incidence density of accidents per thousand person-years of exposure was calculated.

OBSERVATIONS & RESULTS

The population under study comprised of 2825 persons, out of which 1507 were males & 1318 were females. The 15-45 year age-group had the highest population with 1425 persons (50.4%).

A total of 300 accidents occurred in one year in the total population. Incidence density was calculated to be 106.2 accidents per thousand person-years of observation. (Table 1) Amongst males, maximum number of accidents (36.2%) occurred in the 5-15 year age group. Females met with most of the accidents in the middle age group (45.7% in the 15-45 year age group). Only 4.6% cases were reported in ≥ 65-year age group. The overall difference in proportions was found to be statistically significant ($p < 0.001$). (Table 2).

As per the category of injury, 72.3% injuries were found to be trivial & minor, whereas there were 16.3% serious & 11.0% very serious injuries. Only one fatal domestic accident was reported which was a fall sustained by a ≥ 65-year old woman. (Table 3).

As per ICD-10 classification, 'Falls' formed a major mode of injury. Fall at level & fall from height led to about 44.0%

of home accidents. About one-third of home accidents (34.6%) occurred due to exposure to inanimate mechanical forces. Contact with heat & hot substances led to 13% accident cases. Only one case of accidental threat to breathing occurred (Choking). No accidents occurred either due to drowning, contact with venomous animals/plants, exposure to forces of nature and accidental poisoning or exposure to noxious substances .(Table 4).

As per the place of occurrence of accident, maximum number of accidents (53.3%) occurred in the courtyard followed by 20.6% in the living room. 16.3 % accidents occurred in the kitchen whereas only 2.3% accident occurred in the bathroom. Domestic accidents in 'other' places in the house (i.e. stairs, roof, cowshed) were only 7.3% (Table 5)

Figure 1

Table 1: Distribution of Domestic Accident cases as per age

Age- group (year)	No.of individuals (n=2825)	No.of cases	% of persons injured in each age-group	No. of injuries in each agegroup as % of total injuries (n=300)
0-5	232(8.2)	77	33.2	25.7
5-15	467(16.5)	76	16.3	25.3
15-45	1425(50.4)	103	7.3	34.3
45-65	521(18.4)	29	5.5	9.7
≥ 65	180(6.4)	15	8.3	5.0
Total	2825(100.0)	300	10.6	100.0

Figures in parentheses indicate percentages.

Figure 2

Table 2: Distribution of domestic accident cases as per age & sex

Age- group (years)	Males	Females	Total
0-5	44(34.6)	33(19.1)	77(25.7)
5-15	46(36.2)	30(17.3)	76(25.3)
15-45	24(18.9)	79(45.7)	103(34.3)
45-65	6(4.7)	23(13.3)	29(9.7)
≥ 65	7(5.5)	8(4.6)	15(5.0)
Total	127(100.0)	173(100.0)	300(100.0)

Figures in parentheses indicate percentages.

$\chi^2 = 38.18$, $df = 4$, $P < .0001$

Figure 3

Table 3: Distribution of domestic accident cases as per age & category of injury.

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Age Group (Years)	Injury Category					Total
	Trivial	Minor	Serious	V. Serious	Fatal	
0-5	41(53.2)	21(27.3)	9(11.7)	6(7.8)	-	77(100.0)
5-15	18(23.7)	31(40.8)	18(23.7)	9(11.8)	-	76(100.0)
15-45	30(29.1)	43(41.7)	17(16.5)	13(12.6)	-	103(100.0)
45-65	13(44.8)	12(41.4)	3(10.3)	1(3.4)	-	29(100.0)
≥ 65	--	8(52.8)	2(13.2)	4(26.4)	1(6.6)	15(100.0)
Total	102(34.0)	115(38.3)	49(16.3)	33(11.0)	1(0.3)	300(100.0)

Figures in parentheses indicate percentages.

$\chi^2 = 34.7$, $df = 12$, $P < .001$

Figure 4

Table 4: Distribution of accident cases as per mode of injury.

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Mode of Injury (ICD-10)	No. of Cases	%
Fall at level	81	27.0
Fall from height	52	17.3
Exposure to inanimate mechanical forces	103	34.3
Exposure to animate mechanical forces	12	4.0
Accidental drowning and submersion	-	-
Other accidental threats to breathing	1	0.3
Exposure to electric current, radiation & extreme ambient air temperature & pressure	5	1.6
Exposure to smoke, fire & flames	5	1.6
Contact with heat & hot substances	39	13.0
Contact with venomous & plants	-	-
Exposure to forces of nature	-	-
Accidental poisoning by & exposure to noxious substances	-	-
Overexertion, travel and privation	2	0.6
Accidental exposure to other unspecified factors	-	-
Total	300	100.0

Figure 5

Table 5: Distribution of accident cases as per place of accident.

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Place of injury	No. of Cases	%
Room	62	20.6
Kitchen	49	16.3
Bathroom	7	2.3
Courtyard	160	53.3
Others	22	7.3
Total	300	100.0

DISCUSSION

Injury as a research problem has been largely ignored in developing countries. Rural & urban development in

transition exposes households to unsafe environments. With advances in modern medicine & control of infectious diseases in the middle of this century, accidents have emerged as the principal threat to the health & welfare of people. (10) Hospital based data may incompletely reflect the occurrence of injury in the population as many injured patients might not seek or manage to obtain hospital care. Further, variations in research design and methodology made comparisons across studies difficult. Hence, this study was conducted to find out the incidence & pattern of injuries in a rural area of North India.

A total of 300 accidents occurred in one year in the study population. Our study revealed an overall incidence density of 106.2 accidents per thousand person-years of observation, higher than studies in Ghana (78 per 1,000 per year) (6), Pakistan (45.9 per 1,000 per year) (7), Tanzania (32.7 per 1,000 per year) (11), Vietnam (76 per 1,000 person-years) (12), and Sri-lanka(82.6 per 1,000 person-years) (13). This could be explained by the all-inclusive definition of domestic accident in this study to include all injuries regardless of severity, as against other studies in which only injuries that led to treatment in the hospital or loss of at least a day's work were recorded. A study of domestic accidents in an air force community in India found that average incidence of domestic accidents was 110.56 per 1000 per year.(14) Another study carried out in Delhi found it to be 110 per thousand per year. (15)

DOMESTIC ACCIDENTS AS PER AGE & GENDER

It was observed in the present study that maximum number of domestic accidents occurred in the 15-45 year age-group (34.3%), although when calculated as the percentage of the population of this age-group, it constitutes only 7.3%. This could be explained by the fact that a large proportion of population is in the 15-45 year age bracket. 0-5 & 5-15 year age-group suffered from 25.7 & 25.3% accidents respectively.

33.2% children in the 0-5 year age-group were injured, of which boys reported more domestic accidents compared to girls (44 vs 33 cases). The large number of accidents in the under-five year age group can be explained on the basis of their exploratory habit. Children are at high risk because of their natural curiosity, their mode of reaction, their impulsiveness and their lack of experience in the calculation of risk . Age 1-4 years was found to be most vulnerable with a rate of 49 per thousand persons-years by Mittal et.al. (16)

A study about accidents in the Nigerian children reported highest number of accidents in 5-9 year rural age-group. Boys were found to be more involved in domestic accidents. (17) A survey of domestic childhood accidental injuries (1998) conducted in a rural general practice in Arau, Perlis, found out that male children between the age of 6-12 years were the most commonly affected with a male to female ratio of 1.7:1 (18)

8.3% individuals were injured in the ≥65 year age-group in this study. Home accidents in the older people can be explained on the fact that old persons are more susceptible due to decline in physical & mental functions, chronic diseases & slower reflexes. Community-based studies carried out in Ghana (1999), Driscoll et.al. in Australia and Mcleod et.al. in Wellington reported higher injury incidence in older people. (6, 19, 20)

In this study, Females met with more domestic accidents as compared to males. There were 173 accidents in females, which were more in middle age group (45.7% in 15-45 years age group). This may be because females in this rural study area spent more time at home and are actively involved in household and kitchen work.

DOMESTIC ACCIDENTS AS PER THE CATEGORY OF INJURY

In the present study, more than 70% of accidents were trivial & minor in nature. Also, 16.3% serious & 11.0% very serious accidents were reported. Only one fatal case occurred which was in a ≥65 year old female.

A study carried out in an airforce community documents that 57.3% of domestic accidents were moderate, 31.8% trivial & 10.8% severe in nature (14). Another study in children reports maximum number of minor injuries (66.8%) in under-five children (21).

A study on Non-fatal Injuries in 'US Children & Youth' showed that the youngest children had the lowest proportion of serious injuries (17.7%) while adolescents had more proportion of serious injuries (38.7%) (10).

DOMESTIC ACCIDENTS AS PER MODE OF INJURY

In this study, falls form a major mode of injury. Falls at level and fall from height led to a total of 44.3% of domestic accidents. Many other studies carried out in India and abroad also report falls as the commnest mode of injury (2, 7,14,16,22). Uneven brick/kacha floor, floor at different

levels and use of ill-fitting rubber slippers led to many falls.

34.6% accidents occurred due to exposure to in-animate mechanical forces like cuts and struck injuries. Similar mode of accidents was found to be common in a rural-based study carried out in Perlis and Tunisia (18, 23).

Contact with heat and hot substances led to 13% accidents in the present study. Department of plastic surgery in Virginia school of Medicine, USA reports that grease burn on the hand account for 10% of all major burns seen in the emergency department. These burns occur when the burning cooking oil inadvertently spills on the hand holding the pan (24). An analysis of burn admissions shows that 77.5% of burns occurred at home in the kitchen and among females.(25) The risk factors associated with burns included cooking on open fires, the practice of low-level cooking, leakage, and explosion of pressure stoves, use of unprotected open fires to keep warm during winter and unsafe storage of inflammable substances. Data regarding domestic child burn & scald accidents was collected from four Indian burn centers (Delhi, Hyderabad, Pune & Bangalore) and scalds were found to be the most common type of injury especially from hot food & drink in children in the domestic environment. (26). A study carried out in UK (2000) reported that a large proportion of scald victims per year were the elderly people who had sustained hot water burns in their homes (27).

Exposure to animate mechanical forces (e.g. dog bite, struck by the cattle) led to 4% domestic accidents. 1.6% accidents occurred on exposure to electric current. Nil accident was recorded due to drowning, contact with venomous plants/animals, poisoning or exposure to noxious substances.

DOMESTIC ACCIDENTS AS PER THE PLACE OF ACCIDENT

In the present study, it was observed most of the accidents occurred in the courtyard and room (53.3% & 20.6% respectively). 16.3% cases occurred in the kitchen while 7.3% accidents occurred in 'other places' like stairs, cowshed, roof etc. This was because most of the courtyards were unsafe with partly kacha & partly pucca uneven brick floor and floor at two different levels. Similar pattern has been reported by Mukhopadhyia at an Airforce station in South India (14). However, Mittal et.al observed maximum injuries in bed / living room, kitchen, open ground, bath /toilet, playground, stairs & roof in a descending order. Stairs were found to be a risk factor for 15-44 years age groups (16).

CONCLUSION

The present study was an attempt to highlight the epidemiological features of domestic accidents in the study area. It also tried to address issues in prevention of domestic accidents. eg Health Education in local language regarding prevention of accidents, installation of fences, roof-rails, stair-rails, etc. to prevent accidental falls, & preventing floor-level cooking to avoid accidental burns. Thus, domestic accident cases are a special group in themselves reflecting more clearly than any other, the character & way of living of people. Quite a new pattern of injury attributable to domestic accidents emerges with each technical or cultural change.

LIMITATIONS

Some degree of Recall bias especially with reference to Trivial injuries could not be ruled out.

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