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Research Article

A study on occurrence and risk factors of domestic accidents in South India

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ABSTRACT

Background: The aim of this study was to find out the frequency of domestic accidents and risk factors associated with the occurrence of domestic accidents in a semi-urban community of Chidambaram. The survey focused on age and sex distribution of population, their gender wise education, occupation and association of socio-demographic and household risk factors with the occurrence of domestic accidents.
Methods: A cross-sectional survey was conducted on a representative population of Chidambaram town. The whole population in 300 households were included in this study which came around 1193. Data collection and statistical analysis was done using descriptive statistics, pearson chi square and odds ratio using SYSTAT Epi Info packages. Frequency of domestic accidents along with the risk factors namely age, sex, occupation, family size, family type, housing type, number of rooms, place of kitchen and bathrooms were analyzed.
Results: Frequency of domestic accidents was found to be 8.6% in our study. Majority of the accidents were common in extreme age groups. Majority of domestic accidents were observed in females compared to males and they were 4.5 times more prone to accidents at home. A Significant statistical association was found among females and home makers along with number of rooms present in the houses. There was no significant association between the type of housing and occurrence of accidents. Majority of accidents were observed in families with more than 4 rooms. 95% of houses had their kitchen inside, among them 31.9% had domestic accidents and bathroom placed outside 36.7% of houses showed domestic accidents.
Conclusions: Females are 4.5 times more prone to accidents at home. Out of 103 accidents 83 were in females. This study concludes that the majority of accidents occurred in homemakers.

Keywords: Domestic accidents, Semi-urban community, Frequency, Statistical association, Risk factors

INTRODUCTION

Domestic accident is an accident that takes place at home or in its immediate surroundings and more generally all accidents not connected with traffic, vehicles or sport. Domestic accidents are worldwide public health problem. In some European countries, accidents at home kill more people than road traffic accidents, in spite of strict safety regulations and laws regarding buildings and living areas.[1] Particularly in rural areas, shanty towns or informal dwellings the problem is so grave in developing countries.[2] During early life, the important cause of death, morbidity and disability in the developed world were due to home accidents.[3] 72 children in Europe die every day from domestic accidents which was equivalent to 3 per hour. In the UK alone, it was estimated that 30% of all accidental deaths happen at homes.[4]

Home accidents due to injury and death are of great importance which was equivalent in public health terms as a major epidemic. The hospital data show only a part of the complete picture of physical injuries in a community. Also most of the research, especially hospital based research, has focused on major and fatal injuries.[5] Population based estimates of the burden of common injuries such as falls, burns and farm/field related injuries are still uncommon.[6] Hence, this population based study was conducted to find out the frequency of domestic accidents and associated risk factors in a semi-urban community of Chidambaram, Tamil Nadu.

The objective of the study was to find out the frequency of domestic accidents in semi-urban community of Chidambaram and to identify the socio demographic and household risk factors associated with domestic accidents.

METHODS

Study area

A cross-sectional survey was conducted on a representative population of Chidambaram town. Chidambaram municipality population is about 50,000 according to a survey done in 2005 comprising of 33 wards which is used for training and teaching medical students, interns and post graduates. Out of 33 wards 20 streets were selected by simple random selection and 15 clusters of households were surveyed from these 20 streets comprising of 300 households totally.

Study population

The whole population in 300 households were included in this study which came around 1193. The study population was homogenous in nature with respect to their characteristics such as socio-economic status, literacy rate, living conditions of the people and the health facilities.

Study period

The study was carried out for a period of 5 months from April 2010-August 2010.

Study design

The study was a cross-sectional community based study. Data collection was done using a pre-tested structured interview schedule. House to house visit was done during evening hours when all the members of the household were available. The data were collected from a reliable person in the household. The proforma aimed at collecting information regarding the socio demographic details of the respondent and also any associated risk factors. Respondents were included in this study after getting informed consent.

Data analysis

Statistical analysis was done using descriptive statistics, Pearson chi-square test and odds ratio by using SYSTAT Epi Info Packages. The description of socio demographic features of study population and frequency of domestic accidents along with the risk factors like age, sex, occupation, family size, family type, housing type, number of rooms, overcrowding, place of kitchen and bathrooms and association of the above risk factors with the occurrence of domestic accidents were analyzed.

RESULTS

In the present study, the total number of population surveyed were 1193 from 300 households with 587 male and 606 female individuals. The survey focused on age and sex distribution of population, as it was found that majority of the population 57.6% belong to the age group of 15-44 years, 19% of the population belongs to children <15 years and 7.2% are above 60 years, but the distribution of population was found to be similar in both male and female (Table 1).

Table 1: Age and sex distribution of population.

Age (in	Male	Female	Total (%)
<1	05	03	08 (0.7)
1-4	36	31	67 (5.6)
5-14	76	76	152 (12.7)
15-29	167	215	382 (32)
30-44	149	156	305 (25.6)
45-59	113	80	193 (16.2)
60-74	35	41	76 (6.4)
>75	06	04	10 (0.8)
Total	**587(49.2)**	**606(50.8)**	**1193 (100)**

Table 2: Distribution of respondents by Education and sex.

Education	Male		Female		Total	
	No	%	No	%	No	%
Illiterate	30	5.7	79	14.3	109	10.1
Primary	49	9.3	70	12.7	119	11.1
Secondary	222	42.2	224	40.7	446	41.4
Higher secondary, diploma	92	17.5	71	12.9	163	15.1
Graduates	105	20.0	98	17.8	203	18.9
Professionals	28	5.3	09	1.6	37	3.4
Total	**526**	**100**	**551**	**100**	**1077***	**100**

*Children < 7 years were not included in the table, hence the total as 1077.

The Table 2 shows the distribution of respondents by education and sex in which the children <7 years were not included. Therefore out of 1077, 10.1% of the population were illiterate and among them female illiteracy was more. The majority of the population (41.4%) belongs to secondary level education. According to the distribution of respondents by occupation and sex, out of 587 male 2.9% were unemployed and among 606 female, 47.2% were home makers. So, 40.5% of the population was found to be dependent including both children and old age people. Among employed respondents most of them were salaried individuals including both male and female (Table 3).

Table 3: Distribution of respondents by occupation and sex.

Occupation	Male		Female		Total	
	No.	%	No.	%	No.	%
Dependent child	204	34.8	227	37.5	431	36.1
Dependent old	16	2.7	37	6.1	53	4.4
Unemployed	17	2.9	0	0.0	17	1.4
Home maker	0	0.0	286	47.2	286	24.0
Coolie	121	20.6	21	3.4	142	11.9
Agriculture	18	3.1	0	0.0	18	1.5
Salary	140	23.8	28	4.6	168	14.1
Business	58	9.9	06	1.0	64	5.4
Pensioner	13	2.2	01	0.2	14	1.2
Total	**587**	**100.0**	**606**	**100.0**	**1193**	**100.0**

Table 4: Family details of the respondents.

Family Details	No.	%
Monthly income		
<1000	52	17.3
1000-1999	113	37.7
2000-2999	47	15.7
3000-3999	32	10.7
4000-4999	10	3.3
>5000	46	15.3
Family size		
≤ 3	108	36.0
4-6	182	60.7
>6	10	3.3
Family type		
Nuclear	232	77.3
Joint	66	22.0
Extended	02	0.7
Housing type		
Hut	29	9.6
Kaccha	143	47.7
Pucca	117	39.0
Flat	11	3.7
No. of rooms		
1-3	267	89.0
4-6	32	10.7
>6	01	0.33
Over crowding		
Present	77	25.7
Absent	223	74.3
Total	**300**	**100**

The monthly income of the family (Table 4) shows that majority (55%) of families were below the monthly income of rs. 2000. Above 5000 monthly income was 15.3% and minimum of 3.3% of monthly income between 4000-4999 was found to be the least compared to others. 64% of families had >4 members in their family and majority of the houses surveyed were nuclear families (77.3%).

Among the housing type surveyed, majority of the houses were kaccha houses (47.7%) followed by pakka houses (39%). The number of rooms in the houses surveyed was found to have 1-3 rooms which show majority of 89% and only 0.3% had >6 rooms in their houses. Overcrowding was seen in 25.7% of surveyed families. The frequency of domestic accidents was found to be 8.6% in our study (Table 5).

Table 5: Distribution of frequency of domestic accidents.

Domestic accidents	No	Percentage
Accident	103	8.6
No accident	1090	91.4
Total	**1193**	**100**

The domestic accidents according to age groups were investigated and majority of the accidents was found to be between age groups of 1-4 years (16.4%) and above 75 years (20%). There was a significant statistical association between age group and occurrence of domestic accidents as represented in the (Table 6). According to gender wise, the majority of domestic

accidents were observed in females (81%) compared to males (Figure 1). Hence, this association was statistically significant as females were 4.5 times more prone to accidents at home.

A significant statistical association was found between occupation and occurrence of domestic accidents which happen to homemakers (67.1%). The reason was that they spend more time at home than males (Table 6).

Table 6: Association of domestic accidents with respondents socio demographic characteristics.

Variables	Domestic accidents		Group differences
	Present (n = 103)	Absent (n = 1090)	
Age group			
<1 (8)	0 (0.0)	08 (100)	$\chi^2 = 15.749$ df = 7 P = 0.028
1-4 (67)	11 (16.4)	56 (83.6)	
5-14 (152)	10 (6.6)	142 (93.4)	
15-29 (382)	21 (5.5)	361 (94.5)	
30-44 (305)	33 (10.8)	272 (89.2)	
45-59 (193)	20 (10.4)	173 (89.6)	
60-74 (76)	06 (7.9)	70 (92.1)	
>75 (10)	02 (20.0)	08 (80.0)	
Gender			
Male (587)	20 (3.4)	567 (96.6)	$\chi^2 = 40.018$ df = 1 P < 0.001 OR=4.5, 95%CI[2.7-7.4]
Female (606)	83 (13.7)	523(86.3)	
Occupation (n =813)**			
Graduates (64)	0 (0.0)	64 (100)	$\chi^2 = 47.09$ df = 8 P < 0.001
Dependent old (53)	07 (13.2)	46 (86.8)	
Unemployed (16)	01 (6.2)	15 (93.8)	
Home maker (283)	51 (18.0)	232 (82.0)	
Cooli (137)	06 (4.4)	131 (95.6)	
Agriculture (18)	01 (5.6)	17 (94.4)	
Salary (167)	10 (6.0)	157 (94.0)	
Business (61)	0 (0.0)	61 (100)	
Pensioner (14)	0 (0.0)	14 (100)	

**Population aged >20 years were only included in his table for occupation. Hence the total as 813.

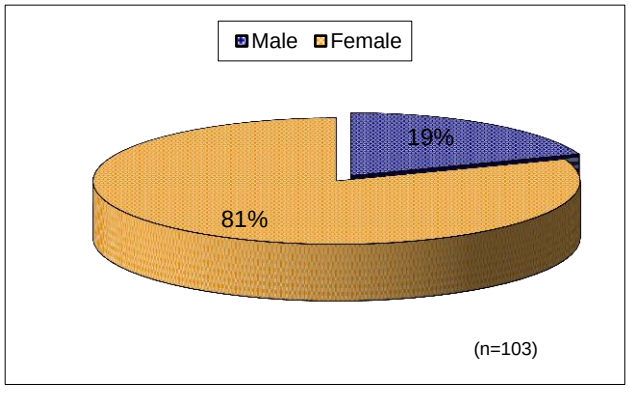

Figure 1: Pie chart showing gender wise distribution of domestic accidents.

In family size there was no significant association with occurrence of accidents. Accident was observed only in 93 (31%) households out of 300 households surveyed. More than one accident was reported from few houses. For statistical purposes, the joint and extended family types were clubbed. Less number of accidents (29.7%) occurred in nuclear families which was also not statistically significant (Table 7).

Majority of domestic accidents occurred in Kaccha houses (31.5%) and there was no significant association between type of housing and occurrence of accidents. But there was a statistical association between number of rooms and occurrence of accidents. Majority of accidents were observed in families with more than 4 rooms (48.5%). 95% of houses had their kitchen inside and among those accidents occurred in 31.9% of houses. Moreover the domestic accidents occurred when the bathroom was placed outside (36.7%), but there was statistically no significant association (Table 7).

Table 7: Association of domestic accidents with various household risk factors.

Variables	Domestic accidents		Group difference
	Present (n = 93)[§]	Absent (n = 207)	
Family size(n = 300)			
≤ 3 (108)	28 (24.1)	82 (75.9)	$\chi^2 = 3.91$ df = 2 p = 0.141
4-6 (182)	63 (34.6)	119 (65.4)	
> 6 (10)	04 (40.0)	06 (60.0)	
Family Type			
Nuclear (232)	69 (29.7)	163 (70.3)	$\chi^2 = 0.758$ df = 1 p = 0.384
Joint ǂ (66)	23 (34.8)	43 (65.2)	
Extended ǂ (2)	01 (50.0)	01 (50.0)	
Type of housing			
Hut (29)	06 (20.7)	23 (79.3)	$\chi^2 = 4.81$ df = 3 p = 0.18
Kaccha (143)	45 (31.5)	698 (68.5)	
Pucca (117)	41 (35.0)	76 (65.0)	
Flat (11)	01 (9.1)	10 (90.9)	
No. of rooms			
1 – 3 (267)	77 (28.8)	190 (71.2)	$\chi^2 = 4.81$ df = 1 p < 0.02
> 4 (33)	16 (48.5)	17 (51.5)	
Place of kitchen			
Inside (285)	91 (31.9)	194 (68.1)	$\chi^2 = 2.304$ df = 1 p = 0.129
Outside (15)	02 (13.3)	13 (86.7)	
Place of bathroom			
Inside (180)	49 (27.2)	131 (72.8)	$\chi^2 = 3.002$ df = 1 p = 0.080
Outside (120)	44 (36.7)	76 (63.3)	

§ - Out of 300 households surveyed, accidents were observed only in 93 (31%) households. More than one accident was reported from few houses. ǂ - For statistical purposes the joint and extended family type were clubbed.

DISCUSSION

In our study, the frequency of occurrence of domestic accidents and associated risk factors was conducted in the field practice area of Urban health training centre, Chidambaram. The frequency of domestic accidents during last one year was found to be 8.6%. Similar frequency had been observed by Hang et al and Mock et al as 7.6% and 7.8% respectively.[7,8] Lamawansa et al reported an incidence pattern of 82.6 per 1000 person years.[9] In contrast to this, studies done by Devroey et al and Bhanderi et al showed a lower incidence of 2.7% and 1.7% respectively.[10,11] Out of 300 households surveyed, 1193 population was interviewed among which 587(49.2%) were males and 606 (50.8%) were females. Both male and female population was similar in distribution. 57.6% population belonged to 13-44 years, 19% of population belonged to children <15 years and 7.2% were >60 years. 10.1% of the population were illiterate and among them female illiteracy was more. 41.4 % of the population was qualified up to secondary level education. 47.2% of females were home makers and 2.9% males were unemployed. 40.5% were dependent population including children and old age. Among 300 families surveyed 37.7% of families earn a monthly income of <Rs 2000. And 64% of families had >4 members in their family. 77.3% of families were Nuclear families. 47.7% of families lived in kaccha houses. Overcrowding was present among 25.7% of the families surveyed.

In the present study, domestic accidents were highest in the extreme age groups, 1-4 years (16.4%) and above 75 years (20%). There was statistically significant association between age group and occurrence of domestic accident. Similar results have been observed by Bhandheri et al which showed domestic accidents higher in the extreme age groups as in 0 -15 years (2.1%) and > 60 years (3.4%).[11] Study done by Alptekin et al also reported that age under 14 or over 65 years have highest incidence.[12] In contract to this in their study on pattern of domestic injuries in a rural area of India observed that maximum number of domestic accidents occurred in the 15-45 years age group (34.3%).[13] Large number of accidents less than five years age group can be explained on the basis of their exploratory habit. In the present study female preponderance of 80.6% was seen. This association was statistically significant and females were

4.5 times more prone to accidents at home. Many other studies like Bhandheri et al showed 2.5% and Neghab et al reported 52.1% of female preponderance.[11,14]

The most frequent places of accident was kitchen (63.1%) followed by other space around home (22.4%). Hence, kitchen was the most dangerous place for domestic accidents for all age groups especially children and adults (females). Few studies done by Mittal et al and Alptekin et al reported that kitchen is the second common place of accident next to living room with frequency of 26.7%.[12,16] A study done by Snidero et al reported that kitchen is the most frequent place of accidents (52.9%) as in this study.[17]

Consequently in our study, a significant statistical association was found between extreme age groups, female sex, occupation as homemaker and occurrence of domestic accidents. Mostly the accidents were observed in families with more than 4 rooms and there was no significant statistical association between family type, family size, type of housing and occurrence of domestic accidents. Moreover the place of kitchen or bathroom, inside or outside the house was not found to be associated with occurrence of domestic accidents.

CONCLUSION

Though advances in medicine and control of infectious diseases in the middle of this century were there, accidents have emerged as the principal threat to the health and welfare of people. Hence, a broader study involving the rural population may provide a clearer picture of the epidemiology of domestic accidents in our country. It was recognized that from 300 households surveyed, 103 persons met with domestic accidents and the frequency was 8.6%. Females were 4.5 times more prone to accidents at home. Out of 103 accidents 83 were in females. This study concludes that the majority of accidents occurred in homemakers. Homemaker is the key person who selects the household items and supervises various household activities and establishes the safety rules as well. These activities should be performed by keeping the safety of its members in mind. Hence need for Safety Education is very much necessary.

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