*ijcrr*
Vol 04 issue 02
Category: Research
Received on:21/11/11
Revised on:02/12/11
Accepted on:07/12/11

# AN ASSESSMENT OF PREVALENCE OF INJURY AMONG RESIDENTS IN BOMMANAHALLI, BANGALORE: A COMMUNITY BASED SURVEY.

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## ABSTRACT

**Background:-**Injury is a major public health problem. In India, it accounts for 15% of total deaths and 15% of disability adjusted life year, resulting in 3% of GDP loss for a country.

**Aim: -** To assess the prevalence of injury and its mechanism in Bommanahalli, Bangalore.

**Methodology: -** The study setting included Bommanahalli, a semi urban area in Bangalore with a population of two and half lakh and 21 sub areas. A sample size was determined to be 174 households (WHO – Guidelines for conducting community surveys on injuries). A two stage cluster sampling technique was used. In the 1st stage, 6 clusters (sub area) were randomly selected. In the 2nd stage households were systematically selected till the desired household is obtained (29 households). An interview was done with the household member for demographic details, injury and its mechanism and its impact for the past one year. Descriptive statistics like mean, standard deviation, cross stabs and contingency coefficient were used.

**Results: -** A total of 220 households were approached and 174 responded, with a response rate of 79%. This resulted in 753 persons with an age ranging from 1year to 76 years with a mean age of 26.7 years (± 15.56). In 753 persons, 52 (6.9%) had some form of injury. Analysis of mechanism of injury showed that 40.4% (21) was due to road traffic accidents and 3.8% (2), 9.6% (5), 7.7% (4), 7.7% (4), 3.8% (2), and 15.4%(8) constituted for fall, struck/hit by person or object, stab, fire, poisoning, animal bite respectively. Majority of the injuries 84.6%(44) were unintentional; 5.8% (3) and 7.7%(4) accounted for intentional and self-inflicted injuries. 38.2%(21) of the injured persons had physical disabilities like unable or difficulty in using the arm, loss of vision, hearing etc. 12.7%(7) of the injuries were medico legal, 7.3%(4) of the family members had left job to take care of the injured person.

**Conclusion: -** Injury causes a great burden to the society and thus should be a priority for prevention.

**Key words**- Injuries, Community based survey, Road traffic accidents, Burn related injuries.

## INTRODUCTION

Injury is recognized as a major health problem in most high income countries. It is also an important cause of death and disability in most low income countries. Injury currently accounts for 14% of all disability-adjusted life year (DALY) losses for the world's entire population, and is expected to increase as a health problem globally.[1]

WHO and the World Bank project that injury is likely to account for 20% of all DALY loses for

the world's population by 2020, with road traffic accidents alone being the third-leading cause of DALY losses.[1]

In India and South-East Asia, injuries account for an estimated 15% of total deaths and 15% of DALYs. Consequently, an estimated 1.5 million people die as a result of injuries and 15-20 million are hospitalized with resulting economic losses of 3% of GDP for the country.[2]

Commissioned by the National Commission on Macro Economic & Health, Ministry of Health and Family Welfare, Government of India, supported by World Health Organization South –East Asia Regional Office has started a the project aimed at examining the burden of injuries and violence in the Indian region for the first time.[3]

The report measures magnitude of the problem, nature and type of risk factors for each of the external causes of injuries, current level of interventions and future directions for injury prevention policies and programmes in India. The report estimates that nearly 1,000,000 persons lose their lives with 15,000,000 hospitalizations every year in India.

Road traffic injuries result in death of more than 100,000 people and hospitalization of 1.5 million people in India resulting in an estimated economic loss of 3% of GDP for the country. Driving while intoxicated is a well established risk factor for road crashes.[2]

Nearly 30-40% of road deaths and injuries in India are among riders and pillions of motorized two wheeler vehicles. Nearly half of these deaths and injuries are due to damage experienced by brain and nervous system. Helmets have been proven to reduce deaths, severe injuries, skull fractures, neurological disabilities, extent of hospitalization and consequent socio-economic burden[1].

RTIs lead to huge social, economic and psychological burden on survivors and households due to its unanticipated happening

There are several ways in which information on injuries can be obtained: from national vital statistics systems, through hospital-based surveillance, via community surveys and from specific research studies. In many settings, hospital-based surveillance and community surveys are the two main routes by which information about injuries is obtained. [4]

Hospital-based surveillance systems suffer from a number of shortcomings, not least of which is the fact that they tend to underestimate the burden of injury. Deaths due to injury that occur outside the hospital environment will not be covered by such systems; they also fail to capture those injuries that do not receive hospital attention (either because the injury was not severe enough to warrant medical treatment or because help was sought elsewhere). Community-based surveys, on the other hand, have the potential to collect detailed information on all types of injuries.

Furthermore, in settings where vital statistics and hospital-based data are non-existent or unreliable, community surveys may be the only source of information. It must be stressed, however, that community surveys are not intended to be a replacement for hospital-based surveillance, but rather that they be viewed as a useful adjunct. Nor are community surveys without limitations of their own. Not only are community surveys resource intensive (and for this reason tend to be conducted only periodically) but they are particularly prone to recall bias.[1]

The real extent of those killed injured and hospitalized is not clearly known due to lack of reliable data and absence of research in India. Hence a community based pilot survey was conducted with an objective to assess the

prevalence of injuries and its associated factors among residents of Bommanahalli, Bangalore.

## METHODOLOGY

**Source of data:**

A study was conducted to assess the prevalence of injuries and violence in Bommanahalli, Bangalore. The study setting included Bommanahalli, a semi urban area in Bangalore with a population of two and half lakh. It has got 21 sub areas and 44,000 households according to data collected from Municipal Corporation, Bommanahalli, and Bangalore. Persons who resided in Bommanahalli for the past 3 years were included in the study.

**Sample size:-**The sample size was determined to be 174 households, assuming confidence level of 95%, marginal error of 0.02 and anticipated prevalence outcome of 0.04. (WHO– Guidelines for conducting community surveys on injuries and violence).[4]

**Sampling technique**: - A two stage cluster sampling technique was used. In the first stage clusters (sub areas) were randomly selected. In this study 6 sub areas were randomly selected. In the second stage household were selected systematically in the sub areas till the desired sample is reached. (29 house hold in each sub area).

**Method of data collection: -** WHO Guidelines for conducting community surveys on injuries and violence survey form was used. House to house survey was carried out. Household members were interviewed and information was sought for demographic details, injury event factors, injury related disability, medical care and treatment of injury, post injury impact, injury related death, traffic related injuries, violence-related injury, suicidal behavior, poisoning related injuries, burn related injuries, drowning, fall related injuries in the past one year.[4]

A detailed schedule was prepared for data collection and survey took place for a period of two months. Interview of each household member took approximately 45 minutes and approximately 10 household were visited per day. Ethical clearance was obtained by ethical committee -The Oxford Dental College and Hospital and Research Centre. Permission was obtained from the household members before the interview was done.

**Statistical analysis: -** Data were then fed manually into the computer and proof read once. All the statistical calculations were done through SPSS (Statistical Presentation System Software) for Windows Version 15.0 Evaluation version (SPSS, 2007. SPSS Inc, New York) and Descriptive statistics/frequencies and Contingency coefficient test were employed for the analysis.

## RESULTS

A total of 220 households were approached and 174 responded, with a response rate of 79% and refusal rate of 20 (9%) ,comprising a total 753 subjects of which 424 male and 329 females with mean age 26.7$\pm$15.5 with an age ranging from 1year to 76 years with a mean age of 26.7 years (± 15.56). In 753 persons, 52 (6.9%) had some form of injury. (Graph1)

Majority of the injuries 84.6 % (44) were unintentional; 5.8% (3) and 7.7 % (4) accounted for intentional and self-inflicted injuries. 38.2%(21) of the injured persons had physical disabilities like unable or difficulty in using the arm, loss of vision, hearing etc. 12.7%(7) of the injuries were medico legal, 7.3%(4) of the family members had left job to take care of the injured person. (Graph2)

Analysis of mechanism of injury showed that 40.4% (21) was due to road traffic accidents and 3.8% (2), 9.6% (5), 7.7% (4), 7.7% (4), 3.8% (2), and 15.4%(8) constituted for fall, struck/hit

by person or object, stab, fire, poisoning, animal bite respectively. (Graph3)

## DISCUSSION

A total of 174 households consisting 424 males and 329 females with the mean age 26.7 years were surveyed to assess the Prevalence of Injuries and associated factors among residents of Bommanahalli, Bangalore.

The present study was undertaken as a pilot survey as there was a time constraints for the full term survey. There are several ways in which information of injuries can be obtained that is from National Vital Statistics System, through hospital surveillance or via community based surveys.

Hospitals based survey suffers from number of short comings, hence a community based survey was undertaken which had advantage over the hospital based survey which includes, cases that were not reported to the hospitals, it could define the population under study, it could assess people perception regarding the causes of injury, and allowed for comparison of injury rates of among different geographic region.

In the present study maximum number of injuries was found among the age group 20-24 and 25-44 (24.1 % in each group) .This is similar to study done by C.N Mock et.al on incidence and outcome of injury prevalence in Ghana, where the age group affected was 15-45 years and also in study done by Nilambar Jha et.al on Eastern Nepal showed the highest number of victims (249, 28.6%) in 20-29 years of age followed by 164 (18.9%) in the age group of 30-39 years. [1,5]

A higher number of cases in this age group can probably be explained on the basis that, this is the most active period of life during which there is a tendency to take risk. This shows that people from the most active and productive age groups are involved, which causes a serious economic loss to the community.

The present study revealed more of male victims compared to females in the ratio of 10:2, 44 (84.61%) and 8(15.38%). This is similar to National Health Interview Survey, USA, 1997 which showed 75.7 % of injury affected persons were male and 24.3% were female [M= 498; F= 160]. The predominance of males may be due to the fact that females lead a less active life and mostly remain indoors.[6]

**Road traffic accidents**

The present study showed 40.4% of road traffic related injuries. Male were affected more (40.9%). This is similar to study done by Robyn Norton et.al on unintentional injuries, which showed RTA accounted for 34% and among the victims, the males were 662 (76.1%) and females were 208 (23.9%) respectively. [8]

Analysis of the types of vehicles showed that 31.4% of the accidents were form bus followed by two- wheelers 25.6%. Maximum incidence of RTA was in the age group of 20 to 39 years comprising 51.20%. Most common victim was pedestrian 44% followed by drivers 32.87%, and occupant 23.20%.

**Burn related injuries**

The present study showed 7.7% of injuries due to fire belonging to the age group of 15-19 years and 25-44 years with equal male to female ratio. This is in agreement with the study conducted by Robyn Norton et al on unintentional injuries, where injury due to Fires accounted for 9%. [7]

**Poisonings**

In the present study 3.8% of the injuries were due to poisonings, in the age group of 0-4 years and 15-19 years. A higher prevalence was found in study conducted by Robyn Norton et.al on unintentional injuries, were poisonings accounted for 10%. [7]

**Fall Related Injuries**

In the present study fall related injury accounted for 3.8% in the age group of 20-24 years and 25-

44 years. This was similar to 'A National Health Interview Survey', USA 1997 July 2000, which reported 4.3% falls related injuries. A higher prevalence was found in study conducted by Robyn Norton et.al on unintentional injuries, in which falls accounted for 10%. [6, 7]

**Animal Bite**

15.5% of the subjects were victims for animal bite in the present study. But a lesser prevalence was observed in National multicentre rabies survey on animal bites in India, which was 1.7%.[8]

The present study showed 5.8% intentional injuries; the WHO reports of 2001 shows a higher prevalence of injuries globally of 10.8. [9] The present study showed the 7.7% of the self inflected injuries.

**Type of injury**

In present study fractures were the leading type of injuries 26.9% followed by cut and open wound 21.2%. National Health Interview Survey, USA, reported Sprains and Strains the leading injury types 38.5% followed by open wounds, fractures and contusions; 29.0, 23.7, and 19.0 per 1,000 persons.[7]

**Place of injury**

The present study showed street as the most frequent place of injury followed by home .53.84% and 25% respectively (Graph4). National Health Interview Survey, 2000, reported home was the most frequently reported place of injury –which accounted for 24%. Report for the World Health Organization, on Injury and Alcohol, Emergency Department Study, Bangalore, India, 2001, a greater proportion of the injuries appeared to have taken place in subjects own homes (41.2%) and on the street 36% .[7,10] In the present study 11.53% of injuries occurred in pubs and hotels, Reports by the World Health Organization shows 3.4% of injuries appeared to have occurred in pubs or bars. [9]

**Physical disability**

In the present study 42.32% of the subjects had physical disability because of injury (Graph5). This was similar to the study done by C.N Mock etal on incidence and outcome on injury prevalence in Ghana, were 40% of the subjects had physical disability.[1]

**Limitations of the study**

Though the present study had advantages over the hospital based surveys, had its own limitations such as, small sample size, recall bias, withholding of information and use of proxy respondents can underline reliability of data collected. However with the standardized data collection at community level, the community based survey can act as a useful adjunct.

**Interventions**

The three 'E's, Education, Enforcement and Engineering. These Interventions are considered in terms of preventing the occurrence of injury, minimizing the severity at the time of injury, & following the injury event.

## CONCLUSION

The prevalence of injuries was found among the age group 20-24 and 25-44(24.1 % in each group). More in male compared to females in the ratio of 10:2, 44 (84.61%) and 8(15.38%). Maximum incidence of RTA was in the age group of 20 to 39 years comprising 51.20%. Most common victim was pedestrian 44% followed by drivers 32.87%, and occupant 23.20%. Fractures were the leading type of injuries 26.9% followed by cut and open wound 21.2%. Street as the most frequent place of injury followed by home. 53.84% and 25% respectively and 42.32% of the subjects had physical disability because of injury.

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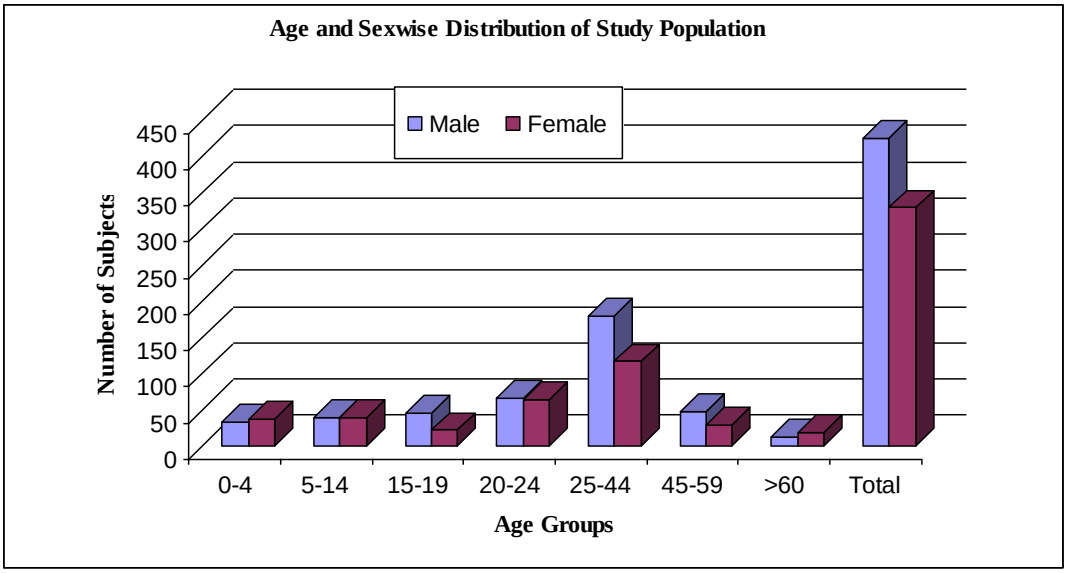
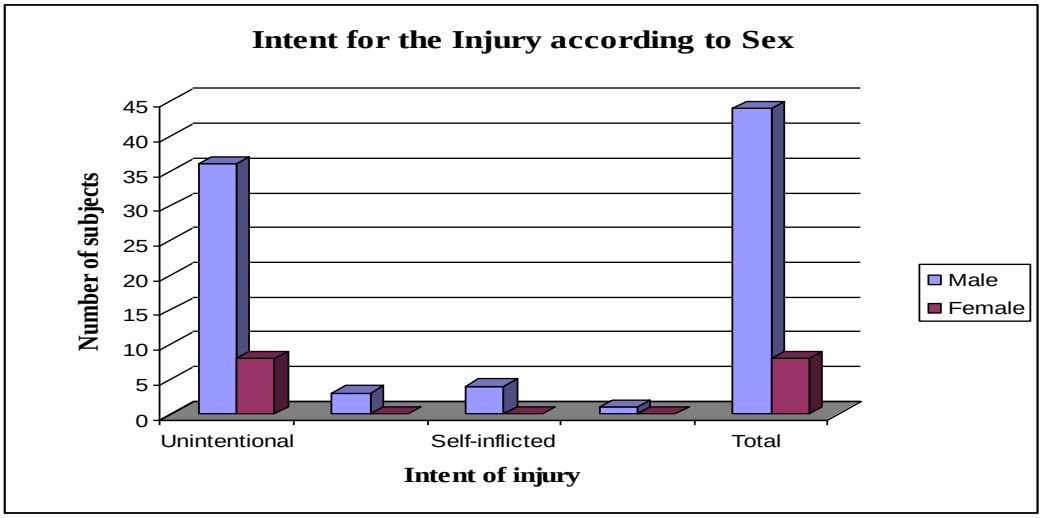
## ACKNOWLEDGMENT

Authors acknowledge the immense help received from the scholars whose articles are cited and included in references of this manuscript. The authors are also grateful to authors / editors / publishers of all those articles, journals and books from where the literature for this article has been reviewed and discussed.

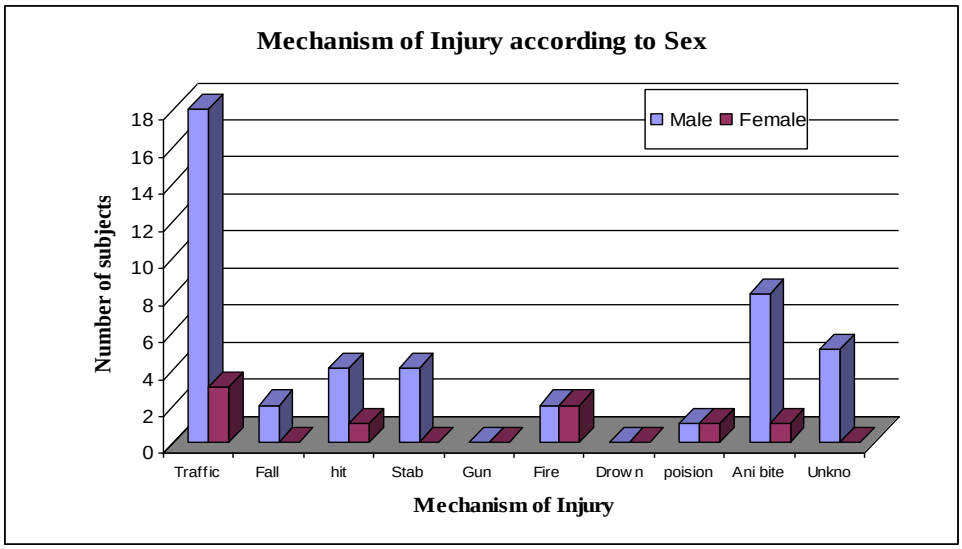

**Graph 1: - Distribution of Study Subjects According to Age and Sex**



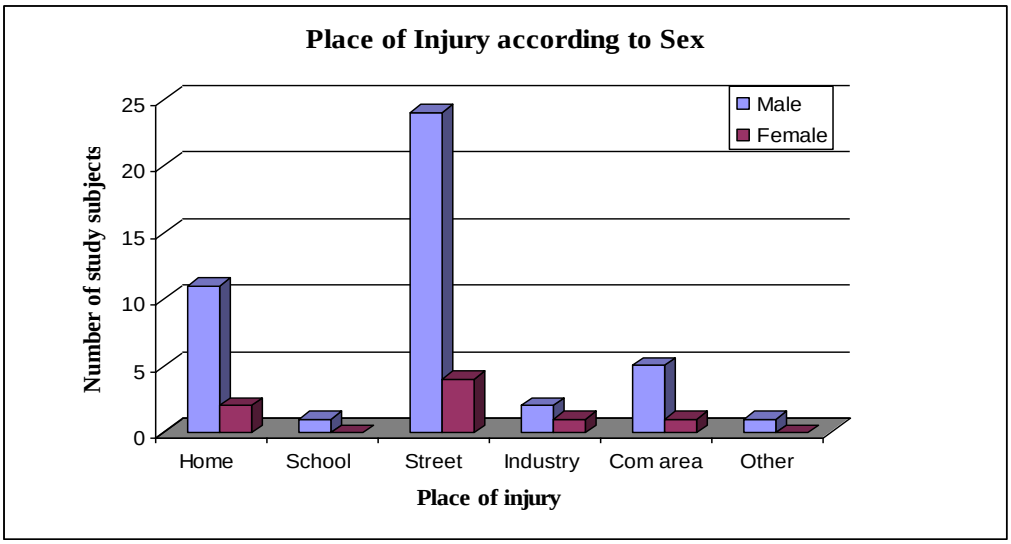
**Graph 2: - Distribution of Study Subjects according to Intent of the Injury and Sex**




**Graph 3: - Distribution of study subjects according to Mechanism of Injury and Sex**



**Graph 4: - Distribution of study subjects according to Place of Injury and Sex**




**Graph 5:- Percentage of Injured Persons Suffering from Physical Disability**