

SHORT ARTICLE

Pattern and cost of physical injury treatment in a rural community.**Ankeeta Menona Jacob**

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Abstract

The global burden of injuries in 2017 showed that 57.2 million people were affected. The study aimed to assess the patterns of injuries and costs related to the treatment of injuries. Injury in rural areas tends to be under-reported, which hinders estimation of the true prevalence of physical injuries for implementing injury prevention strategies at the community level. A community-based, cross-sectional study was conducted in the field practice area of a private medical college from May to August 2019. Physical injuries sustained by 1723 individuals over three months were collected and were classified based on ICD-10. Descriptive data were expressed using frequencies and percentages and median (Interquartile Range). Independent T-test, Mann Whitney U test, Chi-square test was used to determine statistical differences between the variables. The total number of injuries recorded was 105(6.9%) among 1723 individuals. The most common injuries were superficial injuries in 77 (70.0%), of which 98(89.1%), of which the upper 55(50.0%) limb was more affected than lower limbs 43(39.1%). The overall 3-month injury rate was 60.94(49.6-72.23) per 1000 persons. The median amount of money spent on the treatment of injuries was INR 225.0(50.0-1000.0).

Keywords

Wounds and injuries; children; cost analysis

Introduction

The World Health Organization defines an injury as "Physical damage occurring to a human body due to sudden or brief subjection to extreme levels of energy." Injuries are either accidental or unintentional, intended, or deliberate and undetermined intent. (1) The Global Burden of injuries in 2017 showed that 57.2 million people were affected. (2) The prevalence of injuries globally was 15,07,481 in 2017. The incidence rate of unintentional injuries was about 4,15,410 per 100000 persons, which had increased by 19.8%

compared to the frequencies in 1990 more commonly seen among males. (2)

The actual estimation of injuries must include both fatal and non-fatal injuries, which is the first step in public health to prevent injuries by conducting Community-based studies. However, there is a tendency to under-report injuries in rural areas due to the shortage of facilities for the treatment and care of injured individuals in rural areas. Towards this end, this study aimed at assessing the patterns of injuries and assess the treatment cost related to the injuries in a rural community in the coastal region of Karnataka.

Aims & Objectives:

1. To determine the injury rate and the pattern of injury in a rural community in the coastal region of Karnataka.
2. To determine the pattern of injuries and estimate the cost of treatment of injuries in a rural community in the coastal region of Karnataka.

Material & Methods

A community based, cross-sectional descriptive study was conducted in the field practice area of a private medical college in a rural community in coastal Karnataka on all residents residing in that area for at least the past six months. Ethical committee approval was sought before the commencement of the study from the institution. The study was conducted for three months- May 2019 to August 2019. The minimum sample size required was estimated to be 229, given absolute precision of 3% and a confidence interval of 95%, a non- response rate of 10% using nMaster software based on a community-based study conducted in Bangalore city (3).

An operational definition of injury is defined by any damage to the body, such as cuts, burns, bites, wounds, bleeding, & fractures sustained to any family member or household in the community. Informed written consent was obtained after explaining the purpose of the study. A pre-tested semi-structured questionnaire consisting of questions on demographic details, types of injuries experienced, and costs related to the injury were collected by the house to house survey. Students pursuing MBBS were trained to collect data under the supervision of the staff of the department. All households within the specified rural community were enumerated consecutively to cover the entire area. Individuals/ Households that were not available for an interview even after three consecutive visits to the family members were excluded from the study.

Statistical analysis: The collected data were entered into M.S. Excel and analyzed using SPSS software version 20. The qualitative variables of sex, type of injuries sustained, the anatomical location were expressed in frequencies and percentages. The quantitative data, such as age, expenses incurred for the treatment, were summarized through descriptive statistics such as mean, median, standard deviation, and Interquartile range. A Chi-square test

was used to test the differences in various sociodemographic characteristics. Mann Whitney U test was employed to determine the association between the variables.

Results

Four hundred households in the rural community were covered, and data on 1723 individuals in the community were collected. There were 534 children, of which 126(23.6%) were less than five years old. Most of the individuals belonged to the economically productive age group of 19-59 years. Most of the families belonged to Class I 112 (34.5%) and class II 115 (35.4%) socio-economic Class as per Modified BG Prasad classification, and most of them belonged to nuclear family 297(74.3%). The median per-capita income was INR 5000 (3333.3-8625.0).

[Table 1] shows the total number of injuries recorded was 105(6.9%) among 1723 individuals included in the study over three months. The median age of the individuals who reported injuries was 24.0(10.0-45.0) years. The median age of males who were injured was 20.5(10.0-44.5), and females were 18.7(10.0-45.0). The differences in the median ages of injury among males and females did not differ significantly.

The overall 3-month injury rate was 60.94(49.6-72.23) per 1000 persons. The highest proportion of injuries were recorded among the economically productive age group, i.e., 82.1(62.36-101.83). The elderly age group had the least injury rate of 18.7(3.8-33.6) per 1000 persons during the study period. The most commonplace of injury was at home in 63(57.3%) followed by roadside 18(16.4%), workplace 12(10.9%), 13(11.8%) in school, and others 4(3.6%). Of the people who sustained physical injuries during the study period, 80(73.4%) were given first aid for the injuries, and 17(15.5%) required hospitalization for the injuries.

As seen in [Table 2], the most common injuries sustained were superficial, like cuts, abrasions in 77(70.0%). There were no deaths due to injuries during the study period. The extremities were the most affected 98(89.1%), of which the upper 55(50.0%) limb was more affected than lower limbs 43(39.1%). However, the extremities' wounds were more superficial than the head, and the abdomen was more severe physical injuries.

53(48.1%) of the individuals spent INR 200(50.0-1000) at the time of injury. 4 (3.6%) of the individuals spent INR 600.0(125.0-1375.0) after the injury. The

median amount of money spent on the treatment of injuries was INR 225.0(50.0-1000.0). These expenditures were higher among individuals who sustained more severe injuries like fractures, open wounds, and internal injuries.

Discussion

The present study highlights the injury patterns of a rural community in Karnataka. With regards to the age of the individuals with physical injury, the study conducted by Bansal M and Dalal S(4) in rural Bhopal showed that the highest number of injuries were sustained among ages 34-59 years, i.e., 85 (71- 99) per 1000 persons which were similar to the present study findings. Similarly, a study conducted by Chowdhury SH et al. (5) in rural Bangladesh also showed similar results. Individuals aged 19- 59 years sustained the maximum number of physical injuries, i.e., 63.1%, and least injuries among aged 60 and above 8.6%. These results were comparable to our study, i.e., 61(58.1%) and 5(4.7%) among 19-59 years and ≥ 60 years of age. Studies conducted by Mathur A et al. (6), Chalageri HV et al. (3), Kalaiselvana et al. (7) showed that males were more injured than females. In contrast, the study conducted by Hemalatha K, Prabhakar VR (8) in Tamilnadu showed no differences in the sex distribution of injuries, as seen in the present study.

The study conducted by Bansal M and Dalal S (4) in rural Bhopal showed that the injuries most commonly occurred at home, 27%. In contrast, our study estimated a higher proportion of 63(57.3%) injuries at home. Injuries on the extremities were about 70% of rural Bangladesh study participants (5), 27% of the participants in rural Bhopal (4). However, our study reported 98(89.1%) of the injuries on the limbs, which was a much higher proportion. In rural Bangladesh (5), 62.57% received first aid, and 34.17% required hospital admission. In contrast, the present study estimated a higher proportion, i.e., 80(73.4%) received first aid, and a lesser proportion of individuals 17 (15.5%) required hospital admission.

Conclusion

The present study showed that most commonly affected individuals were economically productive, most commonly superficial injuries, and over the extremities. The median cost of treatment of injuries was INR 225.0(50.0-1000.0).

Recommendation

This study highlights the need for the adults' safety, especially in making the home environment more safe and less accident-prone to prevent physical injuries, especially injuries occurring on extremities. The factors affecting health-seeking behavior for physical injuries in rural communities can throw light on the under-reporting of physical injuries in rural communities.

Limitation of the study

Our study had a few limitations. Adults who were at work during data collection were not available to corroborate the injury patterns. The costs estimated were based on the amount spent where bill amounts were available. The coverage of health insurance in this area was not considered, which could have affected the treatment of injuries in the study.

The relevance of the study

As very few studies have been conducted on the topic in the study area, the present study highlights the most common among the general population in a rural community in coastal Karnataka.

Authors Contribution

AMJ contributed to the study's conception and planning, execution of the study, data analysis, and manuscript preparation for the article.

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References

- Holder Y, Peden M, Lund J, Gururaj G, Kobusingye O. Injury Surveillance Guidelines [Internet]. Geneva, Switzerland: World Health Organization; 2001 [cited 2019 May 29] p. 91. Available from: https://www.who.int/violence_injury_prevention/media/en/136.pdf
- GBD 2017 Disease and Injury Incidence and Prevalence Collaborators. Global, regional, and national incidence, prevalence, and years lived with disability for 354 diseases and injuries for 195 countries and territories, 1990-2017: a systematic analysis for the Global Burden of Disease Study 2017. *Lancet*. 2018 Nov 10;392(10159):1789-1858. doi: 10.1016/S0140-6736(18)32279-7. Epub 2018 Nov 8. Erratum in: *Lancet*. 2019 Jun 22;393(10190):e44. PMID: 30496104; PMCID: PMC6227754.[PubMed].
- Chalageri HV, Surendrapura SP, Shastry BN, Murthy N. A cross sectional study of pattern of injuries and its socio-economic impact in an urban area, Bangalore. *Int J Community Med Public Health*. 2016;3(2):419–25.

4. Bansal M, Dalal S. Unintentional injuries in rural area- A Community Based Study in rural Bhopal. *Natl J Community Med.* 2013;4(3):449–53.

5. Chowdhury SH, Karim MN, Rahman MR, Faiz MA, Ahmed F, Selim S. An epidemiological study of injury in a rural community in Bangladesh. *Bangladesh Med Res Counc Bull.* 2015 Apr;41(1):46-51. doi: 10.3329/bmrcb.v41i1.30318. PMID: 27089634. [PubMed].

6. Mathur A, Mehra L, Diwan V, Pathak A. Unintentional Childhood Injuries in Urban and Rural Ujjain, India: A Community-Based Survey. *Children (Basel).* 2018 Feb 8;5(2):23. doi: 10.3390/children5020023. PMID: 29419791; PMCID: PMC5835992. [PubMed]

7. Kalaiselvana G, Dongre AR, Mahalakshmy T. Epidemiology of Injury in rural Pondicherry, India. In: *Journal of injury & violence research.* 2011.

8. Hemalatha K, Prabhakar VR. Prevalence of childhood injuries: A survey of injury epidemiology in rural population of Tamil Nadu, India. *J Med Soc.* 2018;32(1):27–32.

Tables

TABLE 1 INJURY RATE, AGE AND SEX-WISE DISTRIBUTION OF THE INDIVIDUALS WHO SUSTAINED INJURIES IN THE PAST THREE MONTHS

Age Group (in years)	Injury rate (95% CI) in the population in terms of per 1000 population	Male (n=53) n (%)	Female (n=52) n (%)	Total (N=105) n (%)	T Value*	P-value
<18 (n=660)	59.09(41.1-77.08)	22(21.0%)	17(16.2%)	39(37.1%)	0.874	0.35
19-59 (n=743)	82.1(62.36-101.83)	29(27.6%)	32(30.5%)	61(58.1%)	0.502	0.479
≥60 (n=320)	15.6(2.03-29.2)	2(1.9%)	3(2.9%)	5(4.8%)	0.230	0.631
Total (N=1723)	60.94(49.6-72.23)	53(50.5%)	52(49.5%)	105(100.0%)	0.173	0.677

*χ² test, P <0.05 considered significant; Bold indicates the highest frequency

TABLE 2: CHARACTERISTICS OF THE INJURIES SUSTAINED AMONG THE INDIVIDUALS (N=105)

Details	Characteristics	n	%
Type of Injury (As per ICD-10 classification for injuries)	Superficial Injury	77	70.0
	Open wound	10	9.1
	Fracture	7	6.4
	Dislocation/sprain	7	6.4
	Muscle/tendon	3	2.7
	Crush Injury	1	0.9
	Internal organ damage	1	0.9
	Others	4	3.6
Anatomical Site of Injury	Upper limb	55	50.0
	Lower Limb	43	39.1
	Thorax & Abdomen	4	3.6
	Head and Neck	8	7.2

Bold indicates the highest percentage