



EPIDEMIOLOGICAL STUDY OF INJURY PATTERNS IN HOSPITAL ADMISSION IN A TERTIARY CARE HOSPITAL IN KASHMIR VALLEY AND ITS OUTCOME

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ABSTRACT

Background: In the past, injuries were commonly seen as arbitrary and inevitable “accidents”. Nonetheless, over the recent decades, a more profound comprehension of the essence of injuries has shifted these outdated perspectives. Nowadays, both accidental and deliberate injuries are predominantly perceived as events that can be prevented with the right measures. **Aim of the study:** To study epidemiology of Injury Patterns at a Tertiary Care Hospital in Kashmir Valley. **Material and Methods:** It was a Prospective Cross-Sectional study conducted at SMHS and associated hospitals from 7th July 2022 to 20th march 2024. A total of 300 participants took part in the study. **Results:** In our study, the mean age of participants was 35.2 years. Among the study participants, 168 (56%) reported experiencing injuries at home while as 102 (34%) participants reported of experiencing injuries on roads. In our study, the most common site of injury among participants was lower limb (36.6%) followed by head (26.3%) and upper limb (14%). Approximately 67% of the patients were managed by surgical intervention whereas the remaining 33% were managed conservatively. **Conclusion:** This study highlights the importance of understanding injury patterns in a tertiary care setting. Our findings support the need for targeted prevention, better resource allocation, and improved treatment protocols, offering valuable insights for public health and clinical practice.

Keywords: Injury, Epidemiology of Injuries, Targeted Prevention, Treatment Protocol.

INTRODUCTION

Injury, defined broadly, includes any harm to the body from an external cause, whether intentional or accidental. Such harm results from sudden exposure to forms of energy like mechanical, electrical, thermal, chemical, or radiant, all occurring within a specific environment. The patterns of injury often depend on factors like the height of a fall, speed, surface type, and body position during impact (1-3). Globally, injuries lead to over five million deaths each year (9% of all deaths) surpassing combined fatalities from HIV/AIDS, tuberculosis, and malaria by 1.7 times (4). In India, road safety remains a critical issue, as underscored by a recent report from the Ministry of Road Transport and Highways (MoRTH). From 2018 to 2022, road accidents in Jammu and Kashmir (J&K) claimed 4,287 lives, highlighting serious safety concerns.

Although fatalities declined during the Covid-19 years (2020-2021), with 728 and 774 deaths respectively, they rose again to 805 in 2022, reflecting ongoing risks. J&K ranks as India's second-highest region for road accident fatalities, with an average of 900 deaths per 10,000 vehicles. This ranking is further impacted by the doubling of vehicles on J&K's roads since 2014, intensifying the need for robust road safety measures. Analysis of accident reports reveals key factors contributing to road deaths, such as speeding, mobile phone use while driving, substance abuse, lane violations, and neglect of helmets and seatbelts. Addressing these issues is essential to improving road safety and reducing fatalities in the region (5).

Insufficient research exists on injuries in contrast to infectious diseases, despite their significant impact on morbidity and mortality in developing countries. Factors such as rapid industrialization, urban overcrowding, limited safety measures, and inaccessible emergency health services contribute to the escalating burden of injuries in these regions. This underscores the urgent need to prioritize injury prevention and care to address this growing health



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challenge. The societal impact of traumatic injuries is profound, leading to considerable morbidity, mortality, and economic burden. Beyond these immediate effects, a thorough understanding of injury patterns and the demographics of affected populations is crucial for identifying the key risk factors. This knowledge forms the foundation for developing targeted interventions aimed at prevention. However, there is a notable lack of comprehensive data specific to our nation's injury patterns. Despite the significant impact of trauma, it continues to be one of the overlooked issues in modern society. The incidence of trauma has been rising, largely driven by the increase in road traffic accidents, violence, and assaults. With the rising mortality rates among roadside trauma patients, it is essential to study the epidemiology of such cases to reduce trauma-related morbidity and mortality (6). Hence Injury-related morbidity and mortality present a major yet under-examined public health issue, particularly in developing countries. The rapid pace of industrialization, urban overcrowding, limited safety protocols, and restricted access to emergency healthcare services all contribute to the rising injury burden in these regions. This escalating trend highlights an urgent need for focused efforts in injury prevention and trauma care. By studying injury patterns and outcomes, particularly for roadside trauma, we can devise strategies to reduce the high mortality and morbidity rates associated with traumatic injuries. Hence the present study was conducted with the aim to study epidemiology of Injury Patterns at a Tertiary Care Hospital in Kashmir Valley.

MATERIAL AND METHODS

Study Design: Prospective Cross-Sectional study.
Study Setting: Shri Maharaja Hari Singh (SMHS) and associated Hospitals. It is a tertiary care hospital affiliated with Government Medical College Srinagar.
Study Period: The study period was from 7th July 2022 to 20th March 2024.
Study participants: Road Traffic accident patient admitted at SMHS hospital.
Inclusion criteria:
 1. All patients who were admitted with mechanical injuries.
 2. Those providing valid consent.
Exclusion Criteria:
 1. Patients admitted with iatrogenic injuries.

Sampling Technique: Convenience sampling, which is a non-probability sampling technique, was used in the study. All those participants who agreed to participate in this study during the study period

were included in the study. A total of 300 participants took part in the study.

Data Collection Procedure: Data was gathered through interviews with patients admitted to Shri Maharaja Hari Singh Hospital casualty (Orthopedics, Surgery) and casualty wards (Neurosurgery, Surgery, Orthopedics, ENT). A semi-structured proforma was used to document each patient's socio-demographic profile, clinical details, and injury grading. Key demographic details included age, gender, residence, location of injury, type and mechanism of injury, and type of vehicle involved. When patients were incoherent or unstable, information was collected from relatives or friends. Consent was obtained from all participants after briefing them on the study's purpose.

Statistical Analysis: Data obtained from the case chart were entered into Microsoft Excel spreadsheet (2010 or above) and analysed using an appropriate statistical software. Continuous variables were expressed as mean. Categorical variables were expressed as frequency and percentages. Association was derived between some variables with site of injury and mode of management by means of chi square test/Fischer exact test. P value less than 0.05 was considered statistically significant.

Ethical clearance: Study was cleared by the Institutional Ethical Committee of Government Medical College Srinagar.

RESULTS

Table 1 depicts the sociodemographic details of study participants. In our study, the mean age of participants was 35.2 years. Majority (34.7%) of the patients were in the age group 21-40 years. Eighty-six patients (28.7%) were in the age group of ≤ 20 years and 38 (12.7%) patients were >60 years of age. Participants were predominantly males (65.7%) and predominantly belonged to urban areas (70%). Figure 1 shows distribution of study participants as per cause of injury.

Table 2 depicts Injury related characteristics and treatment outcome of study participants. Among the study participants, 168 (56%) reported experiencing injuries at home while as 102 (34%) participants reported of experiencing injuries on roads. In our study, the most common site of injury among participants was lower limb (36.6%) followed by head (26.3%) and upper limb (14%). Approximately 67% of the patients were managed by surgical intervention whereas the remaining 33% were managed conservatively. Table 3 depicts association between different study variables. Age and duration of Hospital stay were significantly associated with site of injury and mode of management (p <0.05).

Table 1: Sociodemographic Details of Study Participants

Variable	Frequency (n=300)	Percentage (%)
Age (years)		

Mean 35.2		
≤20	86	28.7
21-40	104	34.7
41-60	72	24.0
>60	38	12.7
Gender		
Male	197	65.7
Female	103	34.3
Residence		
Urban	208	69.3
Rural	92	30.7
Occupation		
Daily labourer	107	35.7
Student	98	32.7
Home maker	72	24.0
Retired	9	3.0
Govt employee	9	3

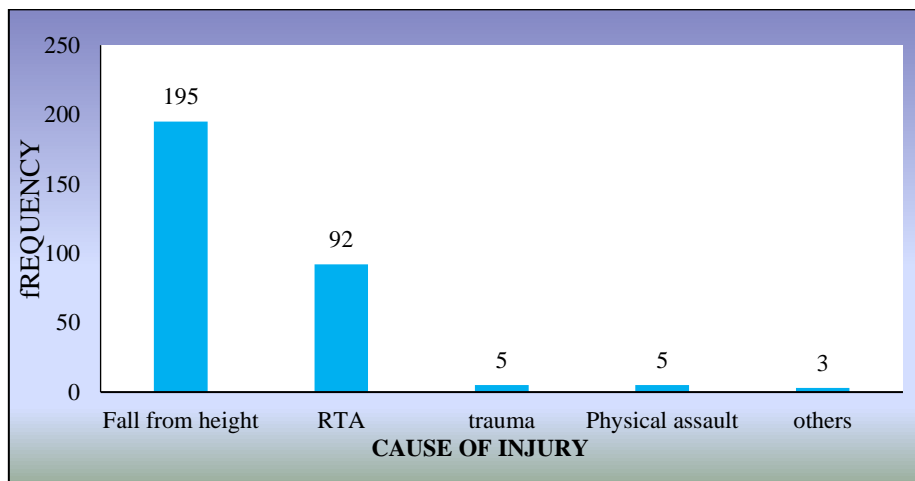


Figure 1: Distribution of study participants as per cause of injury

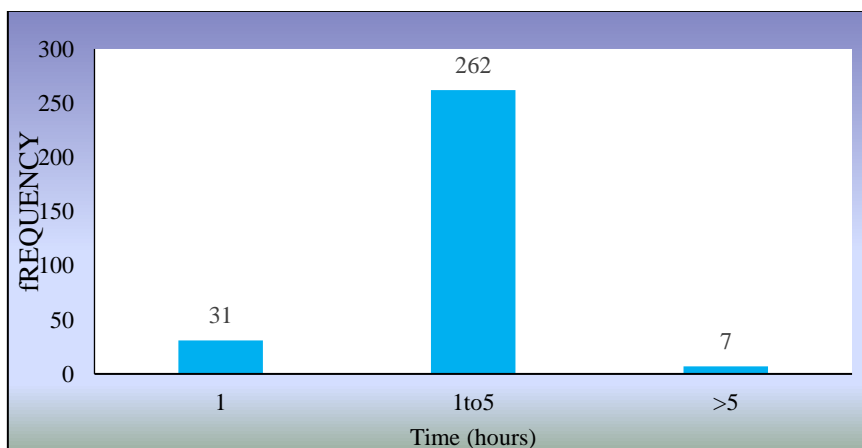


Figure 2: Distribution of Study Participants as Per the Time between Occurrence of Injury and Onset of Treatment

Table 2: Injury Related Characteristics and Treatment Outcome of Study Participants

Variable	Frequency (n=300)	Percentage (%)
Place of occurrence of injury		
Home	168	56.0
Roads	102	34.0
Workplace	30	10.0

Site of injury		
Head	79	26.3
Extremities	152	50.6
Others	69	23.0
Type of injury		
Fracture	157	52.3
Laceration	24	8.0
Abrasion	22	7.3
Bruises	8	2.7
Combination	89	29.7
Mode of management		
Surgical	200	66.7
Conservative	100	33.3
Treatment outcome		
Stable	294	98.0
Unstable/died	6	2.0

Table 3: Association between Sites of Injury & Mode of Management with Other Variables

Variable	Site of injury			P value
	Head	Extremities	others	
Age				<0.05
≤20	29	27	30	
21-40	25	59	20	
41-60	20	37	15	
>60	5	29	4	
Outcome				0.48
Stable/Survived	76	150	68	
Unstable/died	3	2	1	
Duration of Hospital stay				<0.05
<3	25	11	9	
≥3	54	141	60	
Mode of management				
Age	Surgical	Conservative		<0.05
≤20	46	40		
21-40	71	33		
41-60	47	25		
>60	36	2		
Hospital stay duration				<0.05
<3	0	45		
≤3	200	55		

DISCUSSION

Our demographic analysis found that 65.7% of the 300 participants with injuries were male, resulting in a male-to-female ratio of 1.9:1. This trend aligns with similar studies, such as Huda et al. (2017) in Uttar Pradesh with a 2.51:1 ratio, and Dsouza et al. (2014) in Karnataka with a 2.3:1 ratio, though variations exist. Overall, these studies suggest males are more prone to injuries than females, with regional differences affecting the gender ratio (7,8). Our study shows that most patients (34.7%) are aged 21-40, aligning with similar findings by Dsouza et al. (2014) and Paek et al. (2007), who reported high injury rates in young adults. This trend likely reflects increased risk-taking, occupational hazards, and recreational activities common in this

age group (7,9). Our study found a notable urban-rural divide among patients, with 70% from urban areas and 30% from rural ones. This pattern aligns with previous research, like Singh et al. (2014) in Uttar Pradesh, which reported a similar urban (64%) to rural (36%) ratio. These differences emphasize the need to account for regional demographics in healthcare planning (10).

Our study found that falls from heights are the leading cause of injuries (65%), followed by road traffic accidents (30.7%) and assaults (3.4%). Dsouza (2014) in Karnataka (7) and Khanal (2009) in Nepal (11) similarly identified falls and traffic accidents as top causes, though with some differences in percentages. Conversely, Wani (2018) in Kashmir reported traffic accidents as most

common, with falls and violence also significant (1). These variations underscore the role of regional and cultural factors in injury causes. Injury distribution varied by setting, with 56% occurring at home, 34% on the road, and 10% at work. This aligns with Wani's 2018 Kashmir study showing 46.51% of injuries at home, emphasizing home safety. However, Abhajani's 2017 study found more road-related injuries (41.9%), pointing to a need for better road safety. These differences suggest that injury prevention must consider specific regional and cultural factors. Addressing both home and road safety with targeted, context-aware interventions can help reduce injury rates (12).

Our study found fractures to be the most common injury (53.8%), highlighting a major public health concern. Bruises, at just 2.5%, were the least common. The analysis shows a clear shift toward surgical management: 67% of patients in our study had surgery compared to just 33% managed conservatively. In contrast, Mathur (2018) found 61% managed conservatively and only 19% surgically (13).

Study limitations

This study faced challenges from a rapidly growing population with a high injury burden, straining data collection. The 1.5-year duration and lack of follow-up data on discharged patients may have limited insights into long-term outcomes.

CONCLUSION

This study highlights the importance of understanding injury patterns in a tertiary care setting. Young adults, males, and urban residents are most vulnerable, with injuries primarily from falls and road accidents, often affecting the lower limb and head. Surgery is the main treatment, with age influencing management types. A high recovery rate of 98% underscores the effectiveness of timely care. These findings support targeted prevention, better resource allocation, and improved treatment protocols, offering valuable insights for public health and clinical practice

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