Epidemiology and Characteristics of Injury among Trauma Patients Presenting to the Emergency Department at a Private Hospital in Lalitpur, Nepal

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Trauma is one of the reasons for seeking the emergency department of a health care center. Traumatic injuries such as Road traffic accidents, falls, physical assault, etc., are the common reasons for hospitalization, leading to consequences that may range from minor to severe injuries, including death. The purpose of this study is to find out the profile and patterns of trauma patients presenting to the emergency department of the B&B Hospital, Gwarko, Lalitpur. This descriptive study was conducted at B&B Hospital. Ethical clearance was taken from the Institutional Review Committee of the hospital with Approval no. B&BIRC-23-13. All the trauma cases presenting to the Emergency department of B&B Hospital in the Fiscal Year 2079/80 meeting the inclusion criteria were included in this study. A retrospective observational study design was used. Data was extracted from the hospital database with permission from the hospital authority. Total sample size was 825 after excluding the non-traumatic injury, brought dead cases, and incompletely filled data. The findings of the study showed that Road Traffic Accident was the most common cause of trauma (68.5%), followed by Fall injury (19.5%) and Occupational injury (6.5%). Fracture was the most common type of injury (53.5%). The Orthopedics department (74.7%) was mostly involved in the management of trauma, followed by the Neurosurgery department (17.7%). The study concluded that young males and the elderly were mostly traumatized, and the most common cause of trauma was Road traffic accidents, followed by fall injuries.

Keywords: emergency department, road traffic accident, trauma.

The word "trauma", derived from the Greek word "wound," refers to "an injury to living tissue resulting from severe mental or emotional stress, physical injury, or an emotional upset."[1] Traumatic injuries are classified as intentional or unintentional. Unintentional injury includes injuries related to traffic, occupational, and work-related firearms, drowning, and falls, whereas intentional injury includes interpersonal violence and homicide.[2] The nature of injuries and violence varies considerably according to age, sex, and region, and income group, and has a serious negative impact on the lives of patients and their families, as well as on the healthcare system. The majority of trauma deaths occur in the pre-hospital period due to insufficient pre-hospital care, where the first 60 minutes after trauma has been considered as the "golden hour" of trauma.[3–5]

Injuries are the leading cause of death in adolescents and young adults, resulting in long-term physical, psychological, and financial difficulty among the productive age group.[6] In the context of Nepal, transport-related injuries, falls, drowning, animal-related injuries, burns, and violence were the leading causes of trauma-related death and disability. Environmental factors like landslides and floods greatly increase the incidence of injury. Management of the cases requires rapid access to potentially lifesaving treatment, which is challenging, especially in countries like ours.[7–9] Studying the profile of trauma cases can help identify populations at risk, implement and evaluate prevention programs that contribute to substantial health, social, and economic gains.[6,10]

Moreover, very few studies have been done on this topic in the private setting of Nepal. The findings might be helpful for the healthcare workers to get an overview of the distribution pattern of injury and also to plan further treatment. It may also be useful in formulating policies to prevent these injuries. The general objective of this study is to describe the epidemiology and characteristics of injuries presenting to the emergency department of a private hospital. The specific objectives are to assess the socio-demographic information of the trauma patients visiting the emergency department and to find out the cause, anatomical distribution, type, time, and month of trauma occurrence, and the main department involved in the management of trauma.

Materials & Methods

This study was conducted at B&B Hospital, Gwarko, Lalitpur. Ethical clearance was obtained from the Institutional Review Committee of the B&B Hospital (Ref: B&BIRC-23-13). All the trauma cases presenting to the Emergency department of B&B hospital in the fiscal year 2079/80 meeting the inclusion criteria were included

in this study. A retrospective observational study design was used. Data was extracted from the hospital database after getting permission from the hospital authority. Data such as socio-demographic information, causes, anatomical distribution, severity, month, and time of injury were obtained. Some of the missing socio-demographic information was collected by contacting the cases by telephone. The total cases presenting to the emergency department of B&B hospital during 1 year was 2897. The study included all the patients who were received in the Emergency department with at least one traumatic injury. Cases that were brought to death as well as incompletely filled data or those including unanswered calls, mobile unreachable, or switched off were excluded from the study. So, the final sample size was 825. Descriptive statistics such as mean, median, and standard deviation were used to analyze the findings. SPSS version 23 was used for analysis. The findings of the study are presented in graphical as well as tabular form.

Results

Table 1 shows that the mean age of the respondents was 37.42±19.93 years. Young adults (20-39 years) were mostly the victims of trauma, followed by the elderly (60-79 years). The majority of cases were male (74.0%), as shown in **Figure 1**. Most of the respondents had completed secondary level education (39.3%), followed by higher level (27.9%). Regarding ethnicity, most of the respondents were Brahmin/Chettri (39.4%), followed by Janajati (38.9%) and Madhesi (12.2%). Most of them (53.1%) were married. Most injuries occurred between 10 pm and 6 am. **Figure 2** shows the residence of respondents, where the majority of the cases who visited the Emergency department were from inside the Kathmandu valley (67.5%). **Table 2** represents the other sociodemographic characteristics of the cases, where the majority of the cases were Hindu (77.2%), followed by Buddhist (20.1%). Regarding occupation, the higher proportion of cases were students *(*36.4*%)*, followed by service holder (27.5%). Other occupations included labor and factory workers (7.9%).

Table 1: Age Distribution of trauma cases (n=825)

Age distribution	**n**	**%**
(Mean age ± SD:37.42±19.93)		
≤19	119	14.4
20-39	239	29.0
40-59	135	16.4
60-79	233	28.2
≥80	99	12.0
Total	825	100

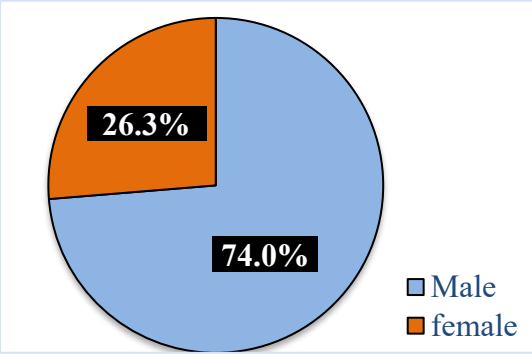

Figure 1: Gender of trauma cases (n=825)

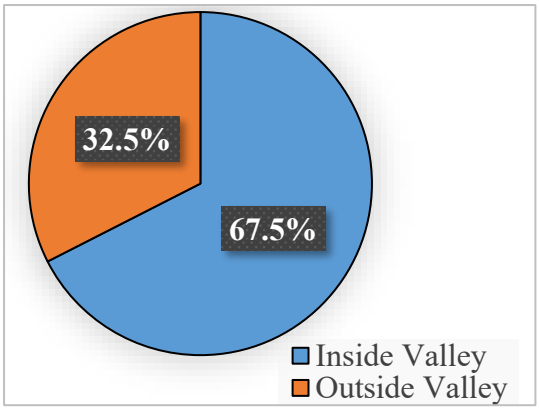

Figure 2: Residence of respondents (n=825)

Table 2: Characteristics of trauma cases (n=825)

Variables	**n**	**%**
Religion		
Hindu	637	77.2
Buddhist	166	20.1
Christian	4	0.5
Islam	15	1.8
Others	3	0.4
Occupation		
Student	300	36.4
Service holder	227	27.5
Unemployed	100	12.1
Homemaker	86	10.4
Business	47	5.7
Others	65	7.9

Table 3: Injury-related Characteristics of Cases (n=825)

Characteristics	**n**	**%**
Type of Injury		
No external injury	290	35.2
Fracture	441	53.5
Abrasion	43	5.2
Amputation	27	3.3
Contusion	14	1.7
Degloving injury	10	1.3
Cause of Injury		
RTA	565	68.5
Fall injury	161	19.5
Occupational injury	54	6.5
Physical assault	29	3.5
Sports injury	8	1
Others	8	1

Table 3 represents the characteristics of injury in the cases where the most common type of injury was a fracture (53.5%). RTA was the most common cause of injury (68.5%), followed by fall injury. Other causes of injury included electric shock, burn injury, and dog bite.

Figure 3 shows the month-wise distribution of trauma cases, where most cases occurred during *Ashoj* and *Kartik* (276 cases), followed by *Shrawan* and *Bhadra* (207 cases). **Figure 4** represents the Anatomical distribution of the trauma cases, where lower extremities were mostly injured (n=377), followed by upper extremities (n=260) and the head and neck region (188

cases). **Table 4** shows that the majority of cases were handled primarily by the orthopedic department (74.4%), followed by the neurosurgery (17.7%).

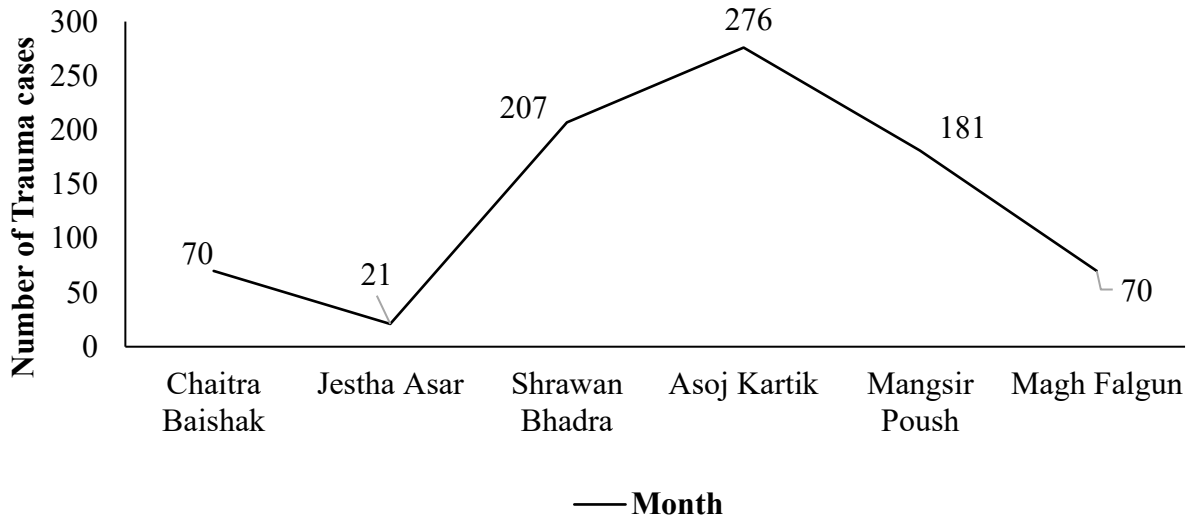

Figure 3: Month-wise distribution of trauma cases

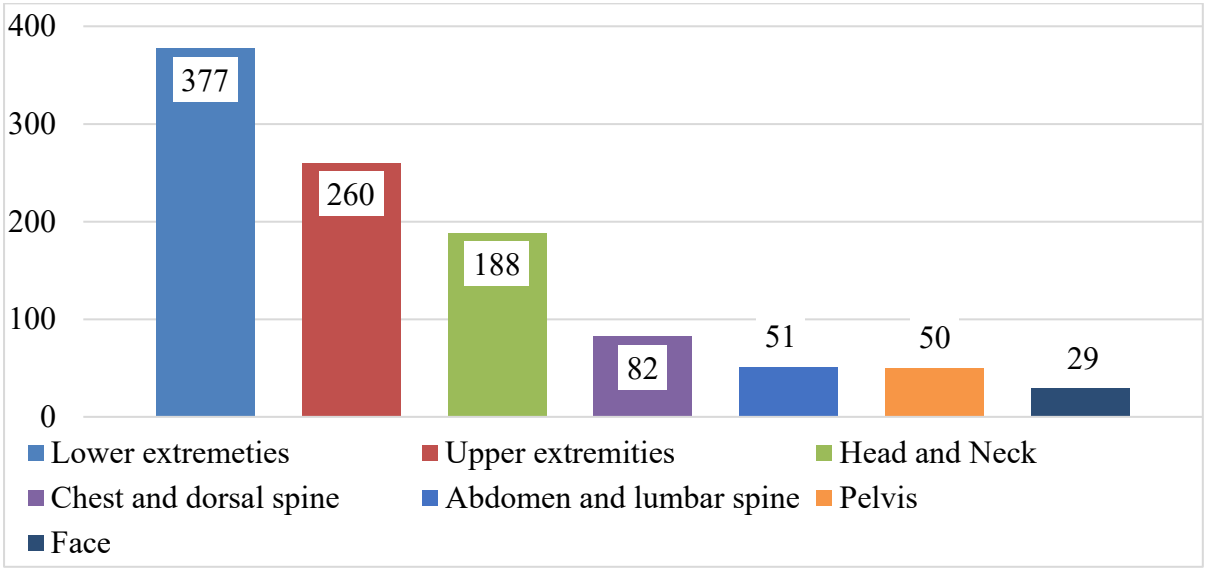

Figure 4: Anatomical distribution of the trauma cases (n=825)

Table 4: Departments primarily involved in the Management of Trauma (n=825)

Department	**n**	**%**
Orthopedics	616	74.7
Neurosurgery	146	17.7
General Surgery	38	4.6
Plastic, Cosmetic, and Maxillofacial Surgery	21	2.5
Others	4	0.5

Discussion

Trauma is the most common cause of visits to the emergency department, where RTA and fall injury are the common reasons for hospitalization. In this study, the mean age of the respondents was 37.42 years, and most of the respondents were between the age groups 20 and 39 years. The majority of the respondents (73.7%) were male. The findings of this study align with the study done by Binus et.al, where the majority of the respondents were male (67.8%).[11] Similar findings were reported in a study done in India, where the majority of the respondents (81.40%) were male, and most of them (34.2%) were between the age group 21-30 years.[12] Also, in another study done in CMC Vellore, India, the majority of the respondents(73.6%) were male, and most of them (33.4%) were between the age group 26-40 years.[4] Likewise, in a study done in Shanghai, China, traumatic injury was higher among males and young adults.[5] The male predominance might be due to frequent outdoor visits by male members for earning and being involved in physically hazardous jobs like construction and industry. Furthermore, contributing factors might be breaking traffic rules by speeding and drinking while driving, which is frequently observed among male members. The age group mostly involved is young adults who are mostly active individuals and travel more for various purposes like study, job, etc., as compared to other age groups.[13]

Regarding ethnicity, most of the respondents (39.4%) were Brahmin/Chettri, and the majority of them (77.2%) were Hindu. Most of the respondents (54.1%) were married. Most of them (36.4%) were students, followed by service holders (27.5%). Most of the respondents had educational qualifications of secondary and higher levels. Similar findings were noted in another study done in Nepal, where most of them were married (61%), the majority (96.1%) were Hindu, and most of the respondents were students (36.1%).[11]

In this study, most of the respondents (67.5%) were from inside the valley, which is inconsistent with the study done by Poudel et al., where the majority of the patients (73%) were from outside the valley.[14] The departments that were commonly involved in the management of trauma cases were Orthopedics (74.7%), followed by Neurosurgery (17.7%). Similar findings were noted in a study done in Vellore, India, where most of the cases were handled by the Orthopedics department (41%), followed by the Neurosurgery department (21%).[4] This might be due to the reason that most of the cases following trauma include fracture and

head injury, which are handled by these departments.

More than half of the respondents (53.5%) presented with fracture, followed by abrasion (5.2%) and amputation (3.3%), while 35.7% had no external injuries. This is inconsistent with the study done in Chitwan, where abrasion was the most common injury (91%), and only 26% of the cases presented with a fracture.[15] By contrast, Abrasion was the most common type of external injury in the study done by Binus et.al.[11] This might be due to the difference in the severity of injury and cause of trauma.

In the present study, the most common cause of trauma was RTA (68.5%), followed by Fall injury (19.5%) and Machinery injury (6.5%). These findings are consistent with the study done by Poudel et.al, where RTA and Fall injury comprised almost 80% of the admitted cases.[14] This could be because of the condition of roads, the use of vehicles that are not in good working condition, geographical conditions, etc. Falls were most common among older adults, which included slips and falls and falls from height.[16]

In this study, Lower extremities (45.7%) were most commonly injured during trauma, followed by upper extremities (31.5%) and head and neck (22.8%). Polytrauma was present in 8.6% of the cases. This aligns with the findings of the study done by Poudel et al., where extremities were mostly involved, followed by the head and neck.[14] Likewise, in a study done in Dhulikhel hospital, injury to extremities was mostly observed (59.8%).[10]

Conclusion

The study concluded that young males and the elderly were mostly traumatized, and the most common cause of trauma was Road traffic accidents, followed by falls and machinery-related injuries. The occurrence of trauma was more frequent during festive months and at night. Lower and upper extremities, followed by head and neck injuries, were the most common sites. So, appropriate safety measures should be applied on the road, at home, and in the workplace to prevent these injuries and to reduce the morbidity and mortality related to trauma.

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Conflict of Interest: None.

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