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**Types of Injuries and Treatment Outcomes among
Patients Admitted at Surgical Ward of Hoima Regional
Referral Hospital Hoima District.**

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ABSTRACT

Road traffic injuries are one of the leading causes of death which accounted for a quarter of 5 million injury deaths, specifically in the 15-29 age categories. It is predicted to be the seventh leading cause of death by 2030 in the world. In sub-Saharan Africa, injury-related mortality and morbidity are very high specifically in low and middle-income countries from which road traffic injury takes the lion's share. The main purpose of this study was to examine the types of injuries and treatment outcomes among patients admitted to the surgical ward of Hoima regional referral hospital Hoima District. The study used a descriptive cross-sectional study design. All trauma patients during the past five years visiting Hoima Regional Referral Hospital were included in the study, Descriptive statistics were used to summarize study findings. The continuous variable was described by mean \pm standard deviation. The proportion and frequency table was used to summarize categorical variables. The study findings revealed that the majority (37%) of respondents used rehabilitative therapy to improve strength and function after injury, (21%) cited antibiotic ointments or liquids to reduce the risk of infection, (32%) cited pain medications to reduce discomfort unlike (10%) cited on resuscitation to maintain circulation, airway, ventilation, and blood volume. The study concluded that a higher proportion of trauma victims and admissions were male patients aged 11-40 years. Road traffic accident (RTC) was the leading cause of mortality and morbidity. The study recommended that motorists should be encouraged to use seat belts, child safety seats and motorcycle helmet for both rider and passenger. Pedestrians be reserved enough side space to walk comfortably with reduced risk of falling into speeding vehicles.

Keywords: Road traffic injuries, Death, Patients, Road traffic accident, Trauma victims.

INTRODUCTION

Globally, injury has become a life-threatening community health problem associated with significant mortality and morbidity worldwide. According to the World Health Organization (WHO) injury and violence surveillance, more than 5 million people die per year due to injury which accounts for 9% of the world's deaths [1, 2]. This figure is more than the combined fatalities resulting from human immunodeficiency virus (HIV/AIDS), malaria and tuberculosis. Approximately, 90% of injury-related mortality occurred in low and middle-income countries. Road traffic injuries are one of the leading causes of death which accounted for a quarter of 5 million injury deaths, specifically in the 15-29 age categories. It is predicted to be the seventh leading cause of death by 2030 in the world [3]. In sub-Saharan Africa, injury-related mortality and morbidity are very high specifically in low and middle-income countries from which road traffic injury takes the lion's share [4]. Recent Global Burden of Disease (GBD) showed that mortality related to injury in sub-Saharan Africa is estimated to be 14.6/100000 persons in 2020

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compared to 97/100000 persons worldwide. In Ethiopia, epidemiological studies showed that the pattern and outcomes of injury are variable in different regions of the country. A study conducted in the University of Gondar revealed that the prevalence of injury was 25%, and of these, 82% were young males. The commonest mechanisms of injury were assault (49.9%) and road traffic accidents (48%) [5]. Another multicenter study conducted in Amhara regional state showed that the prevalence of injury in the region was 55.5% [6]. Those who were young and daily labourers, substance abusers, and those who were had low monthly incomes were the most likely injury victims. A study conducted in Tikur Anbesa Specialized and Teaching Hospital showed that the prevalence of injury was 32.5%. In this cross-sectional study, road traffic accident was the most common mechanism of injury (38%) followed by violence (31.5%). Young population (20-29 years) and those with low monthly income (less than 650 Ethiopian Birr) were more likely to sustain injury incidents compared to the other population groups [1]. In East Africa, the distribution of injury by mechanisms varies for death, hospitalizations, and emergency department visits. The two leading causes of trauma-related death are related to motor vehicles and firearms, accounting for 29% and 18%, respectively, of all injury-related deaths in 2003. [1], in contrast, falls, the leading cause of non-fatal injury, account for about one-third of hospitalizations and emergency department visits (15% and 18%, respectively). Leading causes of death among the fatal injuries are injuries sustained to the central nervous system for 40% to 50% of the total, and the second one is haemorrhage, accounting for 30% to 35%. [7], found represented 21% of 12,140 trauma patients over a 28-year period. In the same country still, Maier et al. found that among the patients receiving cranial CT scans, 10.3% had trauma pathologies in the urban private hospital setting and 21.6% had traumatic pathologies in the rural referral hospital setting. In Kenya [4], found that among patients received at an urban referral hospital following road traffic injuries, 7% suffered from a head injury. In Uganda, to improve epidemiologic surveillance of injuries in Uganda, the Injury Control Centre-Uganda established a trauma registry in 1998, after piloting and validating an instrument for data collection. This registry has been used in five Ugandan hospitals since 1998 [8].

Statement of Problem

Several types of injuries have affected the life of the people in the world for example. Burn injury is among the common causes of childhood injury and results in morbidity and mortality in Uganda. Childhood burn injuries have been a problem for a long time [9, 10]. Burn injuries account for 11% of childhood injuries. In 2001, as boda-bodas (i.e. bicycle and motorcycle taxis) were gaining in popularity, 10% of boda-boda patients presenting to the national referral hospital in Uganda had head injuries, which by 2009 increased to over 35% of boda-boda injury patients presenting with BTI [11]. Approximately 50% of Injuries are the result of motor vehicle, bicycle or pedestrian-vehicle accidents [1]. Falls are the second-commonest cause of injury (20-30% of all BTI), being more frequent among the elderly and the very young population. Violence-related incidents account for approximately 20% of injury, almost equally divided into firearm and non-firearm assaults

Aim

To examine the types of injuries and treatment outcomes among patients admitted at surgical ward of Hoima regional referral hospital Hoima District.

Objectives of the study

To find out the socio demographic characteristics of injury outcomes admitted at the surgical ward of Hoima Regional Referral Hospital Hoima District. To find out the outcome of injury among patients visiting the surgical ward of Hoima Regional Referral Hospital Hoima District. To examine the factors associated with types of injury among patients admitted at the surgical ward of Hoima Regional Referral Hospital Hoima District.

Research questions

- i. What are the socio-demographic characteristics of injury outcomes admitted at the surgical ward of Hoima Regional Referral Hospital Hoima District?
- ii. What is the outcome of injury among patients visiting the surgical ward of Hoima Regional Referral Hospital Hoima District?
- iii. What are the factors associated with types of injury among patients admitted at the surgical ward of Hoima Regional Referral Hospital Hoima District?

METHODOLOGY

Study design

The researcher used a descriptive cross-sectional study. It involved the use of quantitative data and qualitative collection methods, Survey questionnaires were administered to Hypertensive clinic attendees on exit after receiving the services at the Clinic.

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Area of Study

Hoima Regional Referral Hospital, commonly known as Hoima Hospital, is a hospital in the city of Hoima in Hoima District in the Western Region of Uganda. It is the referral hospital for the districts of Bulisa, Hoima, Kibaale, Kiryandongo, Kagadi, Kakumiro, Kikuube, and Masind. The hospital is approximately 110 kilometres (68 mi), by road, north-west of Mubende Regional Referral Hospital.[2] This is approximately 198 kilometres (123 mi), by road, north-west of Mulago National Referral Hospital, in Kampala, Uganda's capital city.[3] The coordinates of Hoima Regional Referral Hospital are 01°25'41.0"N, 31°21'16.0"E (Latitude:1.428051; Longitude:31.354451)

Study population

All trauma patients during the past five years visiting Hoima Regional Referral Hospital

Inclusion criteria

Injured patients' charts with complete clinical and socio-demographic information

Exclusion criteria

Patients who were referred to other centers after admission, non-traumatic patients visiting emergency department and patients' charts with missing variables.

Sample size

The required sample size was calculated using single proportion formula to obtain the sample size needed to estimate the prevalence injury. The Prevalence of injury was taken from the previous study conducted in the region, $P = 0.494$ (8), confidence interval = 95% and margin of error (d) = 5%. Hence, the required sample size was 384 injury patients visiting the surgical Emergency Department.

Sampling technique

All patients with injury within the study period was identified ($N=4390$), and this gave us the sampling frame. The required sample size was obtained by systematic random sampling technique with a skip interval ($K=11$).

Research instruments

A structured questionnaire adapted from WHO injury surveillance and validated for low and middle-income countries was used to collect the information. The researcher included in the questionnaire the following: socio-demographic data (age, sex, level of education, place of residence, income based on GNI per capita, living condition, and occupation), injury mechanism, interval time from injury to admission, systolic blood pressure (BP), diastolic blood pressure (DB), pulse rate (PR), respiratory rate (RR), type, mechanism and pattern of injury, revised trauma score, Glasgow Coma Score (GCS) and length of stay (LOS). The outcome was status on discharge.

Data quality assurance

The structured questionnaire was prepared in English first and translated into the local language, Amharic and again back into translation to English was made to ensure the consistency of the questionnaire. Pretest was done on 5% of the sample size. Data collectors and supervisors was trained on each item included in the study tools, objective of the study and relevance of study. During data collection, regular supervision and follow-up was made. The investigator was cross-checked for completeness and consistency of data on a daily basis.

Data analysis and processing:

After completeness, the data was crosschecked manually, it was entered into epi info version 7 computer programs and transported to Statistical Package for the Social Sciences (SPSS) version 22-computer program for further analysis and cleaning. Descriptive statistics was used to summarize study findings. Continuous variable was described by mean \pm standard deviation. Proportion and frequency table was used to summarize categorical variable.

RESULTS

Socio-demographics of the respondents

Most of the participants were between the ages of 69 and above (27.8%) while few were between 34-38 (4.2%). This implied that majority of participants were old enough to give valid findings. Most of the participants were married (59.9%) unlike 4.5% of participants were single. The findings implied that participants who involved in the study were married. Most of the respondents were protestants (41.9%) followed by Catholics (35.9%), Muslims (17.9%) and other religions with 4.2%. For the case of education level, most of the respondents had attained primary level (64.4%), Secondary level (29.9%), Tertiary institution (5.9%) and none of the respondents had not attained education. Most of respondents 150 (44.9%) were drivers, 120 (35.9%) were traders, 44 (13.3%) were construction workers unlike 5.9% were daily laborers. The findings implied most of respondents had accident injuries as they participated in the study. In relation to the above objectives, other related questions were asked to the respondents and the results were summarized below in figure 1-2.

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Table 1: Socio-demographics of the respondents

Age	Frequency	Percentage
34-38	35	4.2
49-53	50	10.5
54-58	54	14.8
59-64	88	16.2
65-69	93	26.3
69 and above		27.8
Total	334	100
Marital status		
Single	15	4.5
Married	200	59.9
Divorced	119	35.6
Total	334	100
Religion		
Catholic	120	35.9
Protestant	140	41.9
Islam	60	17.9
Other Religion	14	4.2
Total	334	100
Level of education		
Primary level	215	64.4
Secondary level	100	29.9
Tertiary institution	19	5.9
Total	334	100
Occupation		
Trader of any kind	120	35.9
Daily laborer	20	5.9
Driver	150	44.9
Construction worker	44	13.3
TOTAL	334	100

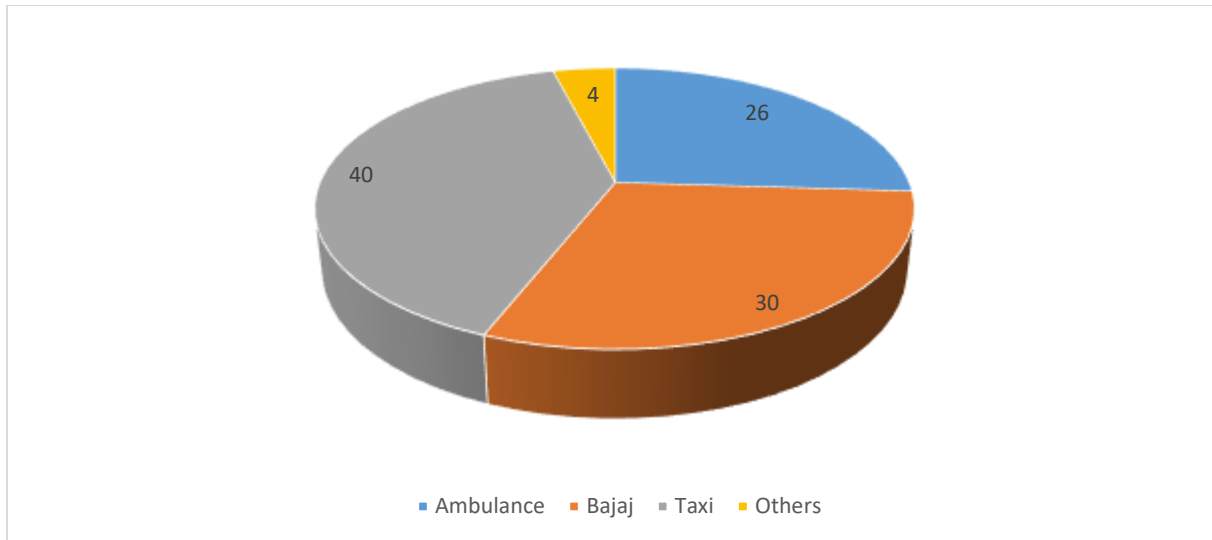


Figure 1: Mode of transport to the health Centre

Most of respondents (40%) used taxis, (30%) used Bajaj (Bodaboda), (26%) used ambulance unlike others (4%) used other means of transport. It was showed that those who used ambulance had severe injury and pain almost to die compared to those who used other modes of transport. In an interview with some doctors, they argued that Age, falls, stab or cut, other blunt force, alcohol use within six hours of the injury event, having been injured at home, open wound, abrasion, and chest or abdomen injury were all significantly associated with using an ambulance to get to the first health facility. Neither distance from injury location to health centre or distance to the closest health facility were significantly associated with ambulance transport to the first health facility

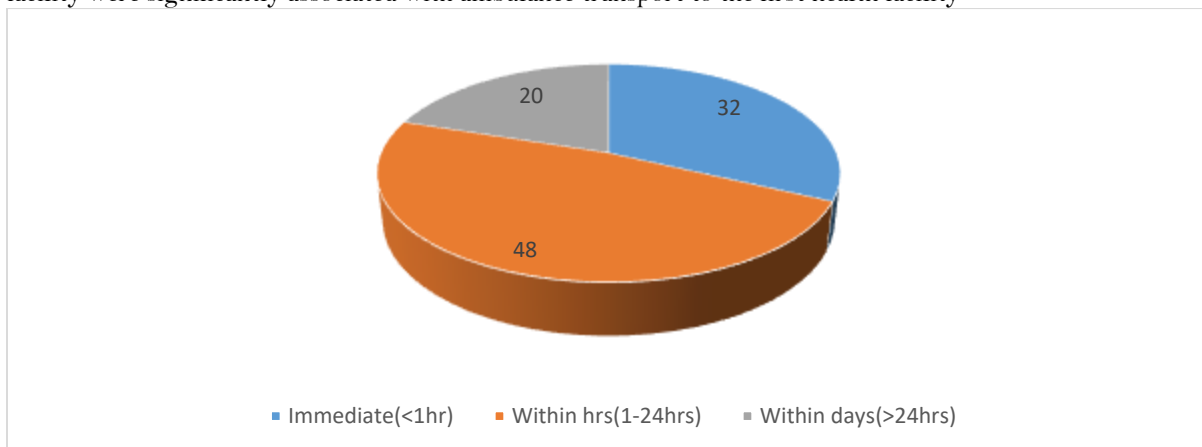


Figure 2: Time to arrive at the institution (health centre) after injury

Majority (48%) reached at the health Centre within hours (1-24hrs) unlike few (20%) had reached within days, that is more than 24 hours. Those who reached at the health Centre within more than 24 hours had severe injuries and this study showed that patients who arrived after 24 hours' injury were more likely to die compared to patients who arrived within 24 hours.

The outcome of injury among patients visiting surgical ward of Hoima Regional Referral Hospital Hoima District

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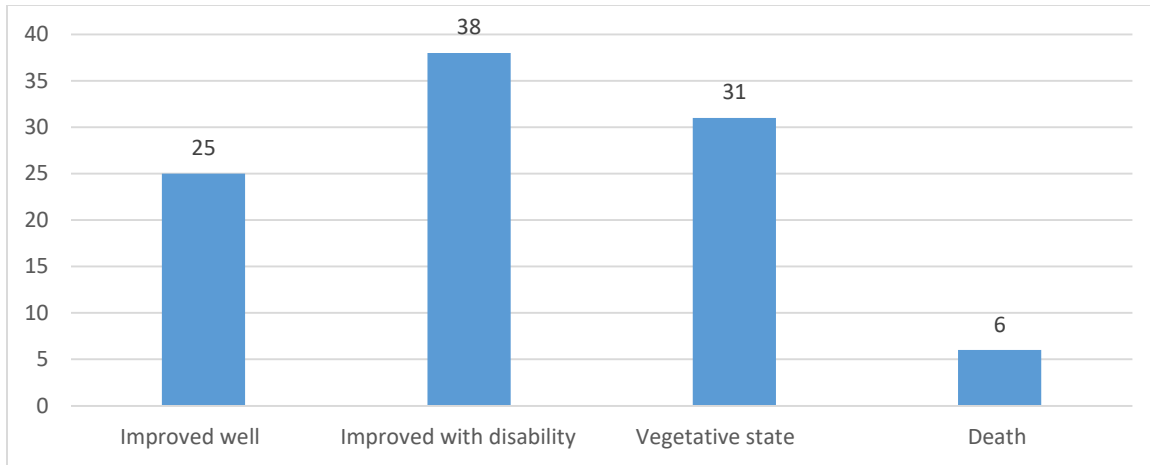


Figure 3: Injury out comes

Most of respondents (38%) had improved but with disability, (31%) were in vegetative state, (25%) had improved well unlike (6%) died of severe injury.

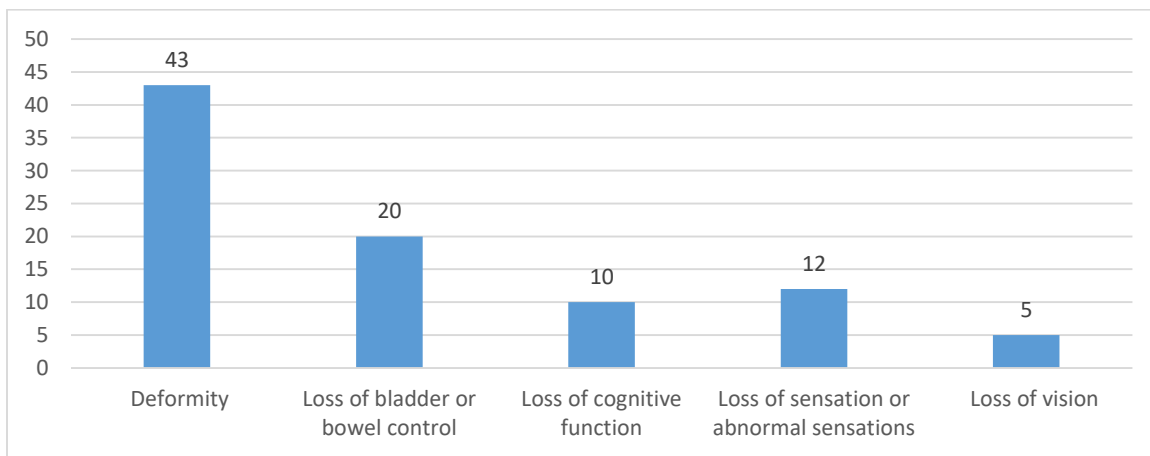


Figure 4: The potential complications of injury

Most of participants (43%) argued that untreated injury can cause deformity, (20%) agreed that injury leads to loss of bladder or bowel control, (10%) showed that it leads to loss of cognitive function, (12%) cited on loss of sensation or abnormal sensations unlike (5%) argued that injury can lead to loss of vision.

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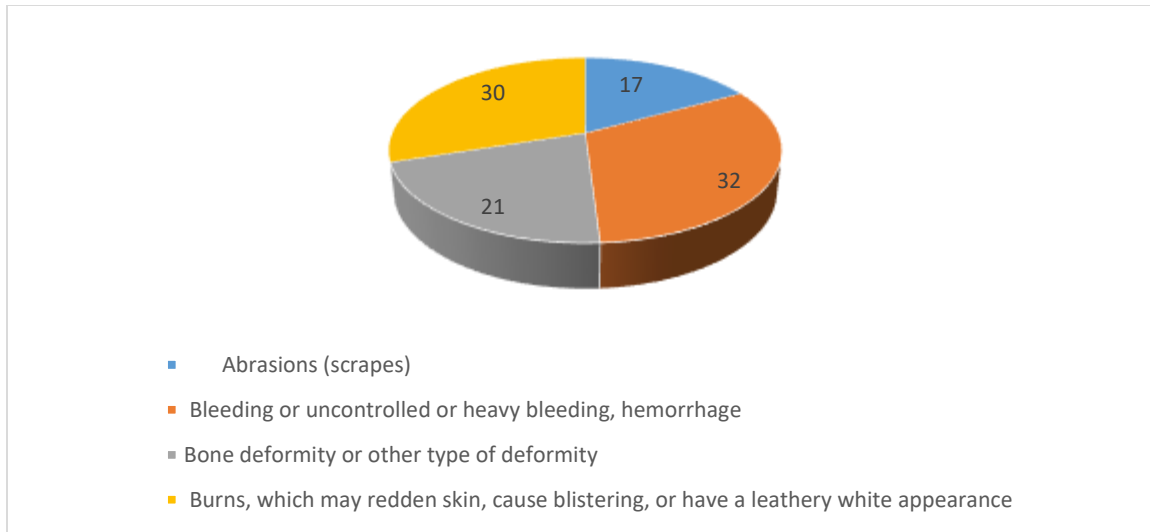


Figure 5: Common symptoms of injury.

Most of (30%) participants showed that burns which redden skin, cause blistering, or have a leathery white appearance were among the signs of injury, (21%) cited on bone deformity or other type of deformity, (32%) cited on bleeding or uncontrolled or heavy bleeding, hemorrhage while (17%) cited on abrasions (scrapes).

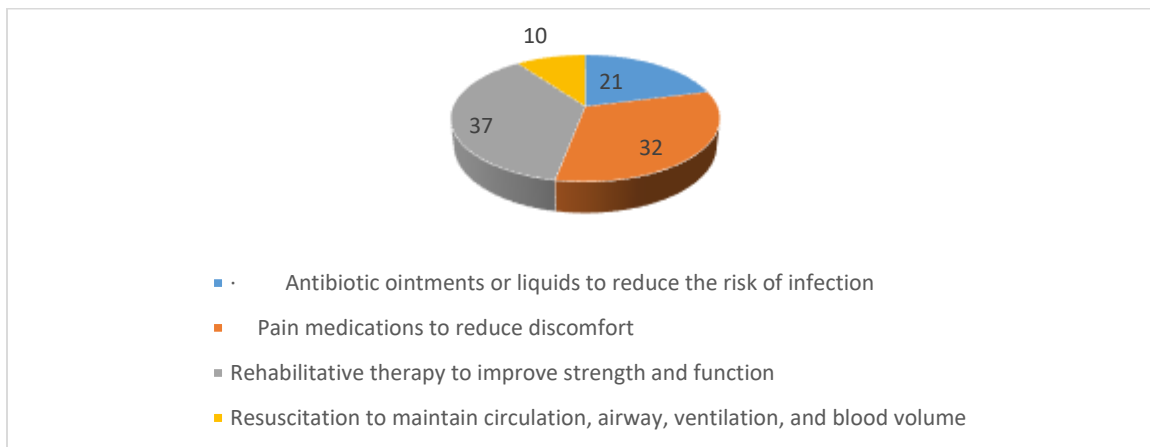


Figure 6: Injury treatment

From the study findings, it was revealed that majority (37%) of respondents used rehabilitative therapy to improve strength and function after injury, (21%) cited on antibiotic ointments or liquids to reduce the risk of infection, (32%) cited on pain medications to reduce discomfort unlike (10%) cited on resuscitation to maintain circulation, airway, ventilation, and blood volume. However, participants in an interview viewed that treatment of injury depends upon its type and severity. Some injuries can be treated with basic first aid techniques such as wound cleansing, application of antibiotic ointments or liquids, wound dressings, rest, application of ice, compression, and elevation. More severe injuries may require cardiopulmonary resuscitation (CPR) and other resuscitation procedures, stitches, or surgery.

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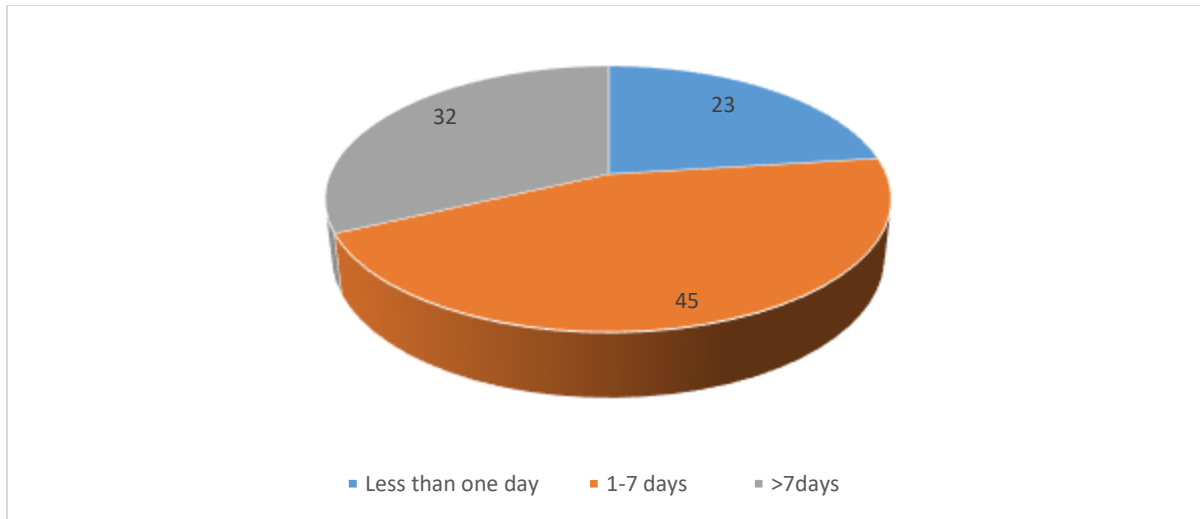


Figure 7: Hospitalization

Most of the participants had stayed 1-7 days, followed by (32%) of respondents who stayed less than one day unlike (23%) had stayed more than 7 days. Some doctors in the interview opined that “patients with more severe injuries (higher ISS or lower GCS) had longer length of Stay (LOS) and higher total hospital charges. Based on the information in this study, the severity of injury was higher among blue-collar workers (often characterized as lower socio-economic groups, and mainly vulnerable road users, such as motorcyclists or pedestrian) compared to white-collar and other occupation groups. Different pattern of injury among blue-collar workers compared with other occupation groups contributed to longer hospitalization periods in this group.

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The factors associated with types of injury among patients admitted at surgical ward of Hoima Regional Referral Hospital Hoima District

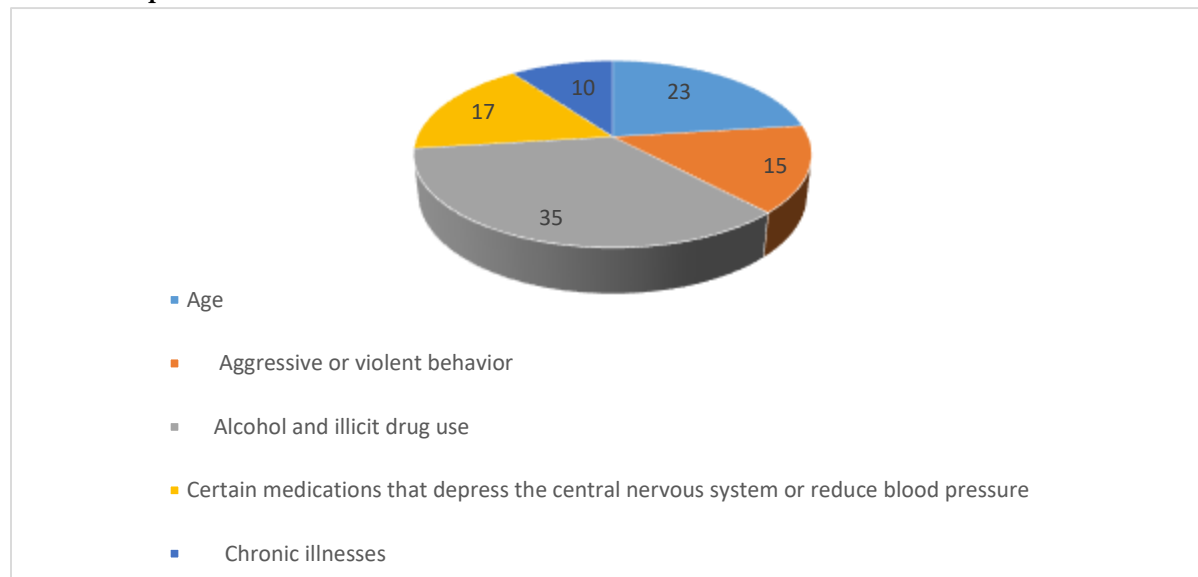


Figure 8: Risk factors for injury

Alcohol and illicit drug use was the most factor contributing to severe injury in most especially road traffic accident (35%). It was also found out that certain medications that depress the central nervous system or reduce blood pressure were among the factors that cause injure majorly TBI (17%) Chronic illnesses also cause injury (23%) while age also contributed to injury and this was majorly among young children and elderly people (10%).

Table 2: Types of injuries

Responses	Frequency	Percentage
Bruise	23	6.9
Cut/open wound	113	33.9
Strain	78	23.4
Fracture	100	29.9
Concussion	20	5.9
TOTAL	334	100

Most of participants cited on cut / open wound as a type of injury (33.9%), (23.4%) cited on strain, (29.9%) cited on fracture, (6.9%) cited on bruise unlike (5.9%) cited on concussion as a type of injury.

DISCUSSION

The socio demographic characteristics of patients associated with injury admitted at surgical ward of Hoima Regional Referral Hospital Hoima District

Most of respondents 150 (44.9%) were drivers, 120 (35.9%) were traders, 44 (13.3%) were construction workers unlike 5.9% were daily laborers. The findings implied most of respondents had road traffic accident injuries as they participated in the study. The findings are in line with a cross-sectional study by [1], road traffic accident was the most common mechanism of injury (38%) followed by violence (31.5%). Young population (20-29 years) and those with low monthly income (less than 650 Ethiopian Birr) were more likely to sustain injury incidents compared to the other population groups. A reverse pattern was found in Norway, where women with high educational levels had higher injury rates [12, 13]. An area-based study from Greece indicated that boys are disproportionately. Socioeconomic differences in injury risks disadvantaged regarding pedestrian injuries when they reside in less wealthy towns [14]. By contrast, a Canadian study found larger socioeconomic differences in traffic injuries (with regard to both morbidity and mortality) for girls than for boys [15]. Swedish studies, on the other hand, found a similar social patterning for both sexes.

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The outcome of injury among patients visiting the surgical ward of Hoima Regional Referral Hospital Hoima District

Most of the participants had stayed 1-7 days, followed by (32%) of respondents who stayed less than one day unlike (23%) had stayed more than 7 days. Some doctors in the interview opined that “patients with more severe injuries (higher ISS or lower GCS) had longer length of stay (LOS) and higher total hospital charges. Based on the information in this study, the severity of injury was higher among blue-collar workers (often characterized as lower socio-economic groups, and mainly vulnerable road users, such as motorcyclists or pedestrian, in the context of Iran) compared to white-collar and other occupation groups. Different pattern of injury among blue-collar workers compared with other occupation groups contributed to longer hospitalization periods in this group. Most of respondents (38%) had improved but with disability, (31%) were in vegetative state, (25%) had improved well unlike (6%) died of severe injury. Due to urbanization, industrialization, rapid motorization, and unsafe driving, the risk of accidents has increased, contributing a large burden of mortality and morbidity, especially in developing countries. The findings are in line with [16], [17], [18], [19]. Road Traffic Injuries (RTIs) are among the leading causes of death and lifelong disability globally and according to the 2015 WHO global status report on road safety, about 1.25 million people die annually on the world’s roads, with 20–50 million sustaining non-fatal injuries. According to [17], in developing countries, injury ranks third as a major cause of death and permanent disability among the adult population next to tuberculosis and HIV/AIDS. The main reason of this burden of injuries is due to lack of organized efforts to reduce its occurrence; and the cost-effectiveness of injury prevention and emergency treatment in these resource limited settings is not yet well understood as the development of emergency care systems is in its nascence.

The factors associated with types of injury among patients admitted at surgical ward of Hoima Regional Referral Hospital Hoima District

Alcohol and illicit drug use was the most factor contributing to severe injury most especially road traffic accident (35%). Impaired driving and other unsafe driving behaviour have also been studied in relation to socioeconomic position. A Swedish study showed that alcohol impairment was a risk factor for injured drivers in all socioeconomic groups, but the proportion of impaired drivers was higher among injured drivers from manual worker families and those with low individual educational attainment [18], [19], [20], [21], [22]. It was also found out that certain medications that depress the central nervous system or reduce blood pressure are among the factors that cause injury majorly TBI (17%). Chronic illnesses also cause injury (23%) while age also contributed to injury and this was majorly found among young child and older people. Most of participants cited on cut / open wound as a type of injury (33.9%), (23.4%) cited on strain, (29.9%) cited on fracture, (6.9%) cited on bruise unlike (5.9%) cited on concussion as a type of injury.

CONCLUSIONS OF THE STUDY

Higher proportion of trauma victims and admissions were male patients aged 11–40 years. RTC was the leading cause of mortality and morbidity. Awareness creation about RTC, improving road safety and posing strict regulation on pedestrians and drivers need further measures. Lastly, as trauma is an ever evolving problem, the government has to establish trauma centers to work on this preventable neglected global problem.

RECOMMENDATIONS OF THE STUDY

Motorists should be encouraged to use seat belts, child safety seats and motorcycle helmet for both rider and passenger. Pedestrians be reserved enough side space to walk comfortably with reduced risk of falling into speeding vehicles. Education programs need to be promoted and policies on speed limits, seat belts, helmets and road engineering practices, restricting alcohol consumption before driving. School programs educating younger generations regarding traffic safety concerns can play an important role in diminishing RTA. Falls can be prevented by installing grab bars in bathrooms and hand rails on stairways. Child abuse prevention programs should be strengthened.

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