Research Article

IT Medical Team
https://www.itmedicalteam.pl/

Health Science Journal
ISSN 1791-809X

2023
Vol. 17 No. 10: 1066

Incidence and Risk Factor of Trauma and Injury among Road Traffic Accidents Patients in Woliyta Zone, Ethiopia: Retrospective Cohort Study

Mesfin Mathewos[1], Tsegaye Alemu[2]*

1 Department of Public Health, School of Health Science, Wolita Sodo University, Wolita, SNNP, Ethiopia

2 Department of Public Health, Health Sciences College, Hawassa University, Ethiopia

***Corresponding author:**
Tsegaye Alemu

tsegayea49@gmail.com

Department of Public Health, health Sciences College, Hawassa University, Ethiopia

Citation: Mathewos M, Alemu T (2023) Incidence and Risk Factor of Trauma and Injury among Road Traffic Accidents Patients in Woliyta Zone, Ethiopia: Retrospective Cohort Study. Health Sci J. Vol. 17 No. 10: 1066.

Abstract

Purpose: the study aimed to investigate incidence and the determinate of trauma and injury among road traffic accident patients in Wolita zone hospitals.

Methods: Retrospective study design was carried out among total of 421 patients. The study was conducted from September 24, 2018, to November 26, 2021. Data were collected by using structured questionaries' and entered into Epi Info version 3.1. For the analysis propose the data was exported to statistical package for social science version 26. Then, data was cleaned and missing values were managed. Descriptive statics were done and results were presented using text, table, and graphs. To identify factors, bivariate and multivariate analysis logistic regression was conducted.

Results: The incidence of trauma in Wolayta zone hospitals was 81.2% (77.7, 85.5). Being rainy weather (AOR=2.9, 95% CI: 2.3-10.5), substance use (AOR= 2.3; 95% CI: 2.1-4.9), being a male sex (AOR= 3.2, 95% CI: 2.2-5.9), and being urban resident (AOR= 0.47, 95% CI: 0.28- 0.79) were significantly associated with road trauma and injury.

Conclusion: The incidence of trauma and injury caused by accidents was substantially high. Rainy weather conduction, substance use, male sex, and being an urban resident are factors significantly associated with trauma. Derivers and pedestrian education on road and weather condition and avoiding substance use during traveling is very critical to reduce traffic accidents.

Keywords: Incidence; Determinate; Retrospective cohort; Study; Trauma and injury; Woliyta; Ethiopia

Received: 05 Sep-2023, Manuscript No. Iphsj-23-14092; **Editor assigned:** 07- Sep -2023, Pre-QC No. Iphsj-23-14092 (PQ); **Reviewed:** 21-Oct-2023, QC No Iphsj-23-14092; **Revised:** 26-Oct -2023, Manuscript No. Iphsj-23-14092 (R); **Published:** 30- Oct-2023, DOI: 10.36648/1791-809X.17.9.1065

Introduction

Trauma is an accident, which occurs on a way or street open to public traffic resulting in one or more persons being killed or injured involving at least one moving vehicle. Hence, accident trauma involves the collisions between vehicles, vehicles and pedestrians, and vehicles and animals or with fixed obstacles [1].

Globally, road traumas are considered a serious public health problem [2]. In most regions of the world, trauma is the persistent public health comprising substantial human and economic losses. This implies that every year globally Road trauma results in 1.25 million lost live and more than 50 million people are injured. Furthermore, because of accidental trauma the world loses 1-3% of its national gross national products (GNP) [3]. The World Health Organization (WHO) estimates that injuries constitute 16% of the global burden of disease [1,2].

The costs of fatalities and injuries due to road traffic accidents have a great impact on societal well-being and socioeconomic development [3]. Injuries disproportionately affect the productive workforce, youth, and school-age children [4]. Almost 50% of road traffic-related mortality occurs in those aged 15-44 years [2].

Over, 90% of deaths from road traffic injuries occur in low and middle-income countries [5]. The high burden of accidental trauma in developing nations is primarily due to an increase in motor vehicle numbers, poor enforcement of traffic safety regulations, the inadequacy of public health infrastructure, and poor access to health services [6].

The largest proportion of serious injuries in Ethiopia was contributed by accidental trauma indicating that it is the major national health burden [3,7]. In Ethiopia, a country with a small vehicle-population ratio, 95 deaths per 10, 000 vehicles were registered between 2007 and 2008 [8]. According to a Road Transport Authority report, 1,800 people died and 7,000 injured in 2003 across the country [9]. According to the Wolayta zone

road authority reports (2018 – 2020/21), Traffic accident is a challenge with many people seriously injured and killed due to road accident and other road users [9].

Therefore, the study aimed to assess factors incidence and determinates with accidental trauma and injury in Wolayta zone public hospitals among injury patients.

Methods and Materials

Study setting

The Zone is located at about 327 KMs South West of Addis Ababa, and 160 km from the capital city of the regional state Hawassa. The Wolayta zone is bounded by Gamo Gofa zone from the South, Dawro Zone from the West, Sidemen Zone from the East, Kamala Tembaro, and Hadiya Zone with Oromia state from North East. There is high traffic flow in the region next to Hawassa town with different roads crossing the zone. An estimated 2, 070,799 populations live in the zone. The zone has 12 districts and 3 towns administrative. Regarding health facilities, 7 hospitals, 68 health centers, and 348 health posts are found [10].

Study design and period

A facility-based retrospective cohort study design was used. The study was conducted in the Wolayita Zone of Ethiopia from September 24, 2018, to November 26, 2021.

Sample size determination and sampling procedures: The sample size is determined using single population proportion formula with the assumption of 95% of the CI, 5% the margin error and previous Prevalence of trauma as 47% [3]. Then, the calculated sample size was 383. By adding a 10% non-response rate, the final calculated sample size was 421.

All Hospitals that are providing Trauma case flow in the Wolayta zone (Dubo Hospital, Bombe hospital, Halale hospital, Christian Hospital, Bitena hospital, Wolayta Sodo University Teaching hospital, and Didaye hospital) were included in this study. Then, the calculated final sample size was proportionally allocated to each hospital based on the previous client flow. In each hospital the trauma cases were listed and then randomly selected cases from the list. Therefore, the number of Trauma cases taken from each hospital was determined based on proportional allocation to the sample size.

Data collection instruments and procedure: The data collection instrument was designed on socio-economic characteristics and Trauma-related issues. The questionnaires were adapted from Ethiopian Demographic Health Survey (EDHS 2016) and different literature. The data collection was conducted through direct face-to-face interviews with individual victims or family attendants or any surrogate caregiver while they arrived for care at the emergency outpatient department (EOPD) and those who are admitted to the surgical ward. Data were collected by using seven health professionals (Nurses and Health officers) in the corresponding Hospitals. A simple random sampling technique was used to access our study units. Internal consistency of the questionnaire was checked by using alpha Cronbach's with a reliability coefficient of ≥0.7. In addition, one-day training was given for data collectors and incomplete questionnaires were excluded from the analysis.

Data management and analysis: Subsequently, the data were entered into Epi Info version 3.1. Then, exported to Statistical Package for Social Software (SPSS) version 26. The data were then cleaned by visualizing and calculating frequencies, and sorting. Finally, descriptive analysis was done and results were presented using frequency and percentage. Bivariate analyses between dependent and independent variables were performed using binary logistic regression. All explanatory variables that had an association in bivariate analyses with a p-value less than 0.25 were entered into a multivariate logistic regression model to assess the independent predictor of trauma accidents. Husker-Let me show test was performed to check model fitness. The presence of association was examined at 95% CI at p-value <0.05.

Results

Socio-demographic characteristics

A total of 421 trauma victims were included in the study. Of all victims who visited the hospitals 73.2% (n=309) were male. The highest numbers of victims were aged between 20-29 years (51.26%) and the mean (+SD) age of the victims was 26.5(±9.10). The commonest occupations were businessman 40% (n=170). Two hundred eight (48%) of victims were single, and more than 1/3 of the victims 161 (38.2%) had attended secondary education. Regarding residence, more than half, 60% (n=252) were urban residents (**Table 1**).

Table 1. Socio-demographic characteristics of trauma victims at Wolayta Zone Hospitals, Ethiopia, 2021.

Variable		Road Traffic Accident		Non-Road Traffic Accident		Total	
		Frequency	%	Frequency	%	Frequency	%
Sex	Male	253	60.09	55	13.06	308	73.2
	Female	91	21.6	22	5.22	113	26.82
Residence	Rural	126	30	43	10.2	169	40
	Urban	218	51.7	34	8	252	60
	Collage/university	81	19.2	17	4	98	24.2
Occupation	Farmer	62	14.7	16	3.8	78	18.5
	Civil servant	55	13	15	3.6	70	16.6
	Businessman	148	35.1	22	5.2	170	40.3
	Others	79	18.8	24	5.7	103	24.5
Wealth	Poor	182	43.2	44	10.4	226	53.6
	Medium	110	21.1	25	5.9	135	27
	Rich	52	12.3	8	1.9	60	14.2

Incidence of injury

From the total of study participants, RTAs accounted for 81.7.0% (n=344) which is followed by falling accidents accounting for 10% (n=42), personal violence 4.8% (n=20) & burning 3.6% (n=15) (**Figure 1**).

Regarding the type of patient, near to half, 40.5% (n=137) of patient were Pedestrian, 32.2% (n=109) and 24.6% (n=83) were derivers and passenger, respectively. Moreover, more than half, 52.3% (n=220), 26.1% (n=110) and 2.9% (n=12) were asphalt, pista and cobel stone, respectively (**Table 2**).

Vehicle type that caused a road traffic accident and Patient's role at the time of injury: Out of the 344 road traffic accidents, 173 (50%) were due to motorcycle crashes followed by truck-related accidents accounting for 73 (21.1%). The majority of RTA was caused by pedestrians contributing to 137 (40.5%) (**Figure 1**).

Driver's behavioral factors: Among 109 driver victims, only 40 responded that they wore safety devices while driving. Helmet and seat belt use among motorcyclists and occupants of vehicles were recorded in 4.5% and 5% of patients, respectively. Regarding substance use, 62%) (n=68) use the substance.

Table 2. Incidence of trauma victims at Wolayta Zone Hospitals in Wolayta Zone, Ethiopia 2021.

Variable		Frequency	Percent
Type o accident	RTA	344	81.7
	Falling accident	42	10
	Personal violence	20	4.8
	Burning	15	3.6
Role of the patient	Pedestrian	137	40.5
	Driver	109	32.2
	Passenger	83	24.6
	Assistant	9	2.7
Residence	Urban	252	59.9
	Rural	169	40.1
Types of road	Asphalt	220	52.3
	Pista	110	26.1
	Coble stone	12	2.9
	Others	79	18.7

Factors association with RTA among traumatized patients: Bivariate and multivariable logistic regression analyses were applied to identify factors associated with an RTA. Bivariate logistic regression analysis identified the sex of the victims, place of residence, marital status of the victims, occupation of the victims, educational status of the victims, weather condition, and substance use and wealth index of the victims. After further running these variables in multivariable logistic regression, occupation of the victims, place of residence, sex of victim, substance use, and the weather condition were significantly associated with an RTA.

Being a resident of urban had 53% decreased odds of having road traffic accidents when compared to residents of rural (AOR= 0.47; 95% CI: 0.28-0.79). Being rainy weather conditions were 2.9 more likely to have RTA as compared to sunny weather conditions (AOR=2.9; 95% CI: 2.33-10.55). Being male sex were 3.2 more likely to have RTA as compared to female sex (AOR= 3.2; (95% CI: 2.2-5.9). Also, those who use substances are 2.3 times more likely to have RTA when compared with their counterpart (AOR=2.3, 95% CI: 2.1-4.9) (**Table 3**).

Discussion

This study revealed that the burden of trauma was found to be 81.7% (95% CI: 77.7, 85.5), which was substantially high. This prevalence was higher than the study conducted in Jimma specialized university Hospital (8.2%) [8], Tikur Ambessa specialized Hospital (36.8%.) [11], and in Areba Minch Hospital 47% [3]. Again the finding in our study area is higher than the study done in Gond University hospitals [12] and Western Ethiopia [13]. This variation might be due to a high number of motorcycle services for transportation of people and poor infrastructure with the difficult weather condition.

The prevalence of trauma in a Nigerian teaching hospital is higher than the current finding accounting for 90.6% [12]. The possible justification could be due to time of study, area of study and socio-demographic variation.

In this study, all trauma victims which male were predominant accounted for 60% of the road traffic accident cases. The finding of this study agrees with studies conducted in Germany (60.8%)

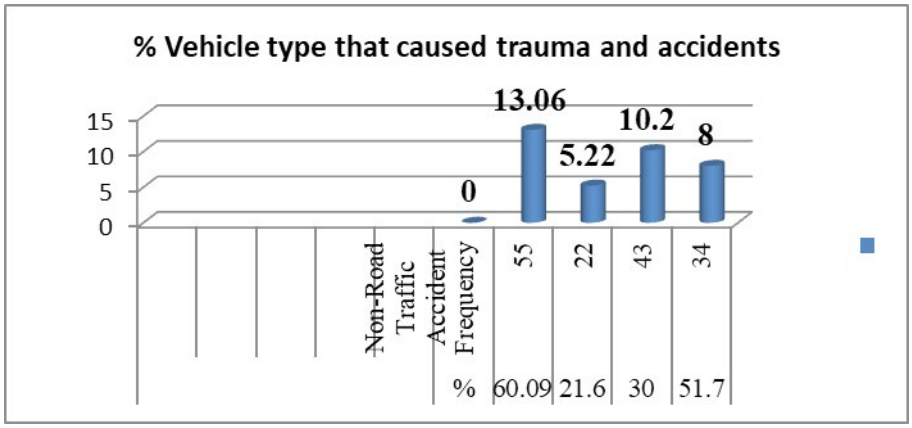

Figure 1 Vehicle type that caused a road traffic accident at Wolayta Zone Hospitals in Wolayta Zone, SNNPR, Ethiopia, 2021.

Table 3. Factors associated with road traffic accident among traumatized patients in Hospitals in Wolayta Zone, SNNPR, Ethiopia, 2021.

Variables		RTA		COR(95% CI)	AOR(95% CI)	P-value
Residence		Yes	No			
	Rural	126(30%)	43(10%)	1	1	
	Urban	218(52%)	34(8%)	2.188(0.98-3.608)	0.472(0.28-0.79)	005 **
Weather	Cloudy	63(14.9%)	22(5.3%)	3(.56-16.07)	2.045(0.88-4.74)	0.095
	Sunny	21(4.9%)	25(5.9%)	1	1	
	Rainy	260(61.7%)	30(7.1%)	13(2.46-68.62)	4.97(2.34-10.55)	<0.001 **
occupation	Farmer	6(1.4%)	6(1.4%)	1	1	
	Civil servant	83(19.7%)	23(5.5%)	2.287(0.70-7.39)	2.15(59-7.85)	0.246
	merchant	190((45%)	31(7.4)	4.52(1.48-13.77)	3.53(0.99-12.47)	0.005
	Others	65(15.4%)	17(4%)	2.78(0.83-9.36)	2.35(2.7-8.92)	0.204
Substance	Yes	117(27.8%)	22(5.2%)	1.88(.81-4.04)	2.3(3.1-4.9)	.04**
	No	194(46%)	51(12%)	1	1	
Sex	Male	256(60.1%)	46(10.1%)	4.52(2.5-9.3)	3.2(7.2-15.9)	.03**
	Female	88(21%)	31(7.4%)	1	1	

Key=others (students, road pity trader) **=p value<.05 COR=crude odds ratio, AOR= adjusted odds ratio 1= references category

[8] Moreover, this study looked at 51.2% of the road traffic accident victims who were found to be between the ages of 20 and 29 followed by30-39(18.3%) years of age. This is in line with other similar studies done in Albania [13] and Kenya [14]. This reflects that a large number of victims are people of the most economically active age group that subsequently leads an economic loss both to the family and the nation. This reminds us that the most productive segment of the population is highly affected by road traffic accidents. The aforementioned findings are in line with other studies [13].

The current study revealed that the majority of road traffic accident victims 40.5% (n=137) were pedestrians, followed by, 32.2% (n=109) were drivers, 24.6% (n=83) were passengers, and 2.7% (n=9) were assistant drivers, in another study road traffic accident was reported that passengers were the majority of cases followed by drivers [3,11]. The predominance of traumatic injury by pedestrians may be related to low public awareness of road use. The second most common of traumatized injury was on drivers these may be related to the possibility that most of them are owners and drivers of motorcycles and Truck so they are at the 1st line to be the victim.

The recent study findings showed that those who had substance use were 2.3 times more likely to have road traffic injury as compared to those who did not use the substance (AOR: 2.3; 95% CI: 2.1-4.9). These findings are similar to a study conducted in Tikur Ambessa specialized Hospital. The possible reason could be psychoactive drugs0 0 like alcohol, chewing chat and other drinking affect the functioning of the brain and may lead to improper driving.

The current study revealed that 40.3% (n=170) of the victims were merchants which is consistent with other similar studies [11]. This often involves traveling with goods purchased, and to maximize profits, they usually opt for the cheapest means of transport available such as motorcycles.

This study found that sex was significantly associated with a road traffic accident, i.e. Males were 3.2 times more likely to sustain injury. This is supported by the findings of other similar studies in Amhara regional hospital. This could be explained by the similarity in male traveling risk, emotional, and risk-taking behavior.

In our study, the weather is associated with road traffic accidents which are among external factors that influence road traffic accidents, especially during the rainy season. This finding was consistent with other studies conducted in Zimbabwe [2]. The possible justification could be driver's view may be masked by rainy weather conditions while driving. This could also decrease visibility and slippery roads during rainy weather which reduces the ability to slow down and therefore increase the likelihood of a high-speed road crash.

Conclusion

The burden of trauma and injury caused by road traffic accident was substantially high. The study identified that rainy weather; Substance use, resident, and sex of the victim were significantly associated with RTA. Therefore, Derivers and pedestrian education on road and weather condition and avoiding substance use during traveling is very critical to reduce traffic accidents.

Ethical Consideration

Ethical clearance was obtained from the Institutional Review Board at the College of Medicine and Health Sciences of Woliyta Sodo University. Permission letters was obtained from Woliyta Zone Health Department and each hospital.

References

1 Ayele TAZB, Tessema GA, Melak MF (2017) Magnitude and patterns of injuries among patients in Gondar University Hospital, northwest Ethiopia: an institutional-based study. Ethiop J Health Sci 2017: 10.

2 Margie Peden RS, David Sleet, Dinesh Mohan, Adnan A, Hyder Eva (2013) Jarawanand Colin Mathers: World Report on Road Traffic Injury Prevention WHO.

3 Direslgne Misker AT, Achamyelesh Mengistu, Fikeru Abera, Matiyas Yalelet, Misganaw Gebrie et al. (2017) Magnitude and Factors Associated with Road Traffic Accident among Traumatized Patients in Arba Minch General hospital. Int J Public Health & Safety.

4 Edrisa Sanyang M, Corinne Peek-Asa PhD, Paul Bass MSc, Tracy L Young MS, Abubacarr Jagne MB et al. (2017) Injury factors associated with discharge status from emergency room at two major trauma hospitals in The Gambia, Africa Sanyang 1451-1458.

5 Feleke Hailemichael MSa WP (2015) Magnitude and outcomes of road traffic accidents at Hospitals in Wolaita Zone, SNNPR, Ethiopia BMC Research Note.

6 Teferi Abegaz YB (2014) Alemayehu Worku Abebe Assrat, Abebayehu Assefa: Road Traffic Deaths and Injuries Are Under-Reported in Ethiopia 9: 7.

7 Ernstberger A (2011) Decrease of morbidity in road traffic accidents in a high income country-an analysis of 24,405 accidents in a 21 year period BMC Public Health: 1471-2458: 1072.

8 Fesseha Hailu Mekonnen ST (2011) Road traffic accident: The neglected health problem in Amhara National Regional State, Ethiopia.

9 Bewket Tadesse Tiruneh BAD, Berhanu Boru Bifftu (2014) Incidence of Road Traffic Injury and Associated Factors among Patients Visiting the Emergency Department of Tikur Anbessa Specialized Teaching Hospital, Addis Ababa, Ethiopia. Hindawi Publishing Corporation Eme Med Int 2014: 6

10 Kehinde LOATOA (2003) Trauma at a Nigerian teaching hospital: pattern and documentation of presentation Pan Africa Med J.

11 Gentiana Qirjako GB, Bajram Hysa, Enver Roshi (2005) Factors Associated with Fatal Traffic Accidents in Tirana, Albania: Cross-sectional Study.

12 Eric Osoro Mogaka, Zipporah Ngang, Joseph Oundo, Jared Omolo, Elizabeth Luman (2009) Factors associated with severity of road traffic injuries, Thika, Kenya. Pan Afr Med J 4.

13 demissie (2016) Risk Factors Associated With Serious And Fatal Road Traffic Accidents In Manzini City, Swaziland.

14 Tiruneh DTBBADaBT (2015) Prevalence of injury and associated factors among patients visiting the Emergency Departments of Amhara Regional State Referral Hospitals, Ethiopia: a cross-sectional study BMC Emergency Medicine.