

Prevalence and associated factors of motorcycle accident injuries in public Hospitals of Southern Ethiopia.

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Research note

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Abstract

Objective The objective of this study was to assess the prevalence and associated factors of motorcycle accident injuries in hospitals of Southern Ethiopia, 2018/2019. **Result** Of the total 423 road traffic injury, motorcycles were involved in 213 (50.4%) of the road traffic accidents. The presence of poor road conditions like loose gravel, steep descent, and rough road was responsible for 44.6% of motorcycle accident injury. The odds of motorcycle accident injuries were 50% and 52% less likely to occur during sunny and foggy weather conditions respectively compared to rainy weather conditions.

Introduction

A road traffic accident is an unexpected, unplanned occurrence that usually produces injury, death or property damage (1). Globally, Road traffic injuries accounted for 23% of all deaths worldwide. It causes an estimated 13 million deaths and 20–50 million disabilities worldwide annually (2).

Road traffic injury (RTI) continues to be a major public health problem worldwide and it is associated with high morbidity and mortality globally (3).. It was the leading cause of death, hospitalization and long term disability in the first four decades of life (4, 5).. Worldwide 1.2 million people are killed in road traffic accidents, and also responsible for 10% of the deaths and 15% of disabilities (6, 7).

Road traffic injury was estimated to be the ninth leading cause of death across all age groups globally, and are predicted to become the seventh leading cause of death by 2030 (8). The rise in death peal in low- and middle-income countries, attributed to urbanization and motorization accompany rapid economic growth. In many of these countries, necessary infrastructural developments, policy changes and levels of enforcement have not kept pace with vehicles (4)..

More than Eighty percent of road traffic deaths occur in Low income and middle-income countries (4, 7). Increasing motorization and other factors increased road traffic accidents and resulted in the number of mortality and morbidity in developing countries (7).

A qualitative study done in central Ethiopia indicated that economic problems, pedestrian ignorance and the current mismatch of vehicle fleet and existing road conditions were the major factors for RTI (9). Previous studies indicated that poor road conditions were responsible for Road traffic injury (10)..

A study done in Addis Ababa Ethiopia, drivers (35%) were the most vulnerable group of road traffic injury (11). Motorcycle injury was the highest as compared to other vehicles. A study done in Iran revealed that 59.2% were motorcycle accident injury (12).. A study done in Sri Lanka revealed that Motorbike accidents were 71% (13). A study from sub-Saharan Africa indicated that motorcycles were responsible for 58% of RTA, Followed by motor vehicles, bicycle and other means of transportation (14, 15). A study was done in holy sodo also indicated that 72.5% of motorcycle accident injury was reordred by unlicensed riders (16).. Sixty-eight percent of motorcyclists had been involved in RTAs since they started riding (17)Environment-related factors like bad weather, traffic congestion or busy roads, and poor road

conditions were associated with road traffic injury (12).. Rainy weather conditions were responsible for 13.8% of a road traffic accident (18, 19).. Adverse weather conditions like rainy, foggy, and snowy days were a contributing factor for over 37% of the RTA (20).

Globally report indicated that motorcycle accidents were accounted for 23% of death (21).. The motorcycle was responsible for more than 70% of road traffic deaths in Thailand and 44% in Colombo, Sri Lanka (22). Although there was a high prevalence of RTI, there is limited literature that identifies prevalence and factors associated with motorcycle accident injuries in the study setting. Therefore, this study is aimed to assess the magnitude and associated factors of motorcycle accident injuries in public hospitals of southern Ethiopia.

Methods

An institution based cross-sectional study design was conducted in selected public hospitals of Southern Ethiopia from December 1st 2018-to-March 30th, 2019. The data collection tool was adapted from the injury surveillance guideline document of WHO developed in 2001. All victims with road traffic accident admitted to these hospitals during the study period were selected for interview except those with death on arrival and referral to another hospital. The desired sample size was calculated by Epi-info software for a single population with an assumption of 50% road traffic accident injuries, 5% a margin of error and 95% confidence level. After adding a 5% non-response rate, the final sample size was calculated to be 423. The tool was translated into the local language (Amharic) and pretested among 21(5%) participants at Adare General Hospital, Hawassa-Ethiopia. Collected data were cleaned, coded and entered into Epi data version 3.1 and exported to SPSS version 23 software packages for analysis. Mean, standard deviation and proportions were calculated for descriptive data and the results presented by tables. Factors associated with motorcycle accident injuries were analyzed first using binary logistic regression and variables with p-value < 0.25 were analyzed in multivariable logistic regression. In multivariable logistic regression, the association was analyzed at a confidence level of 95% with their respective odds ratios.

Results

Background information on road traffic accident victims

A total of 413 RTIs were admitted to five hospitals of Southern Ethiopia. Of the total RTIs 311 (73.5%) were male cases, 229 (54.1%) from a rural area, and 160 (37.8%) were passengers (*Table 1*).. The mean age of cases with standard deviation (S.D) was 29.2 years-old (+11.6 years).

The magnitude of motorcycle accident injuries

Of the total 423 road traffic injuries, motorcycle accident injuries were 213 (50.4%) and followed by Minibus 90 (21.3%) and Bajaj 64(15.3%). Poor road conditions like loose gravel, steep descent, and rough road were responsible for 95(44.6%) of the motorcycle accident injuries (*Table 2*)..

Factors associated with a motorcycle accident injury

In this study, the findings of multivariate analysis showed that the type of road and weather conditions were significantly associated with motorcycle accident injuries. Motorcycle was 49.6% less likely to involve in a road traffic accident on a sunny day than on a rainy day as compared to another type of vehicle. The study also revealed that Motorcycle was 52.3.6% less likely to involve in a road traffic accident in a foggy or cloudy day than on rainy days as compared to other type of vehicles. Foggy weather the condition was also responsible for 75(35.2%) of motor accident injuries (*Table 3*).

Discussion

The finding of this study showed that the prevalence of motorcycle accident injuries were 50.35%, which is consistent with the study from Sub Saharan Africa (15, 23). However, this finding was much higher than the global prevalence of motorcycle injuries, 4% (24), in Nigeria 15.9% (23) and in Addis Ababa Ethiopia 1.8% (25). The higher prevalence of motorcycle accident injuries could be explained by the poor socioeconomic status of the region that attributed to poor road conditions and lack of awareness of the motorcycle riders towards traffic rules (26). Nearly half of the motorcycle riders in Malaysia were not licensed, and three quarters don't comply with traffic laws (3).

In our multivariate analysis, the weather conditions of the day showed a significant association with motorcycle accident injuries. The odds of motorcycle accident injuries were 50% and 52% less likely to occur during sunny and foggy/cloud weather conditions compared to rainy weather conditions. This study also revealed that foggy weather the condition was responsible for 35.2% of motor accident injuries. This finding is consistent with previous studies in Wolayta Ethiopia and China (20, 27). It is also similar to a study done in Northern Ethiopia (18, 28). This could be explained by the fact that rainy or foggy weather conditions limit the visibility of nearby objects.

Conclusion And Recommendation

The prevalence of motorcycle accident injuries in this study was higher than the previous works of literature. Poor road conditions and bad weather conditions were responsible for the higher prevalence of motorcycle accident injuries. This study also revealed that rainy weather condition was significantly associated with motorcycle accident injuries. Thus, creating awareness and implementing traffic laws is highly recommended to reduce the risk of motorcycle accident injuries.

Limitations

The limitation of this study was the use of old works of literature due to a lack of recent similar studies in Ethiopia.

Abbreviations

RTI: Road traffic injury; RTA: road traffic accident; SPSS: statistical package for social science; SD: standard deviation; WHO: World health Organization

Declarations

Ethics approval and consent to participate

The study was approved by the Institutional Review Board (IRB) of the College of Medicine and Health Sciences, Hawassa University. Written informed consent was obtained from the study participants and have been approved by the aforementioned IRB.

*Consent for publication:*Not applicable.

Availability of data and materials: The dataset analyzed is included in the main document.

Competing interests: The authors declare that they have no competing interests

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Authors' contributions

FT conceived, supervised the overall process of data collection and enter data. SM and WT designed the study, drafted the manuscript, analyzed and interpreted the data, critically reviewed the manuscript, and approved the final manuscript. Other co-authors designed the study, supervised the overall process of data collection and participate in the review of the manuscript.

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Tables

Table 1: Background characteristics of road traffic accident victims.

Characteristics	Frequency n (%)
Place of residence	N=423
Urban	229(54.1)
Rural	194(45.9)
Sex	N=423
Male	311(73.5)
Female	112(26.5)
Age (in a year)	N=423
≤ 20	109(25.8)
20-30	180(42.6)
30-40	71(16.8)
>40	63(14.9)
Occupation type	N=423
Self-employee	181(42.8)
Student	96(22.7)
Government employee	67(15.8)
Private employee	26(6.1)
Daily laborer	13(3.1)
Unemployed	40(9.5)
Type of victim	N=423
Passengers	160(37.8)
Pedestrians	147(34.8)
Driver	116(27.4)

Table 2: Magnitude of motorcycle injury and conditions of the road

Characteristics	Frequency n (%)
Type of vehicle involved in road traffic injury N= 423	
Bicycle	6(1.4)
Motor cycle	213(50.4)
Bajaj	64(15.1)
Automobile	23(5.4)
Minibus	90(21.3)
Bus	8(1.9)
Lorry	15(3.5)
Animal pulled cart	4(0.9)
Presence of Poor road condition	N=213
Yes	95(44.6%)
No	118(55.4%)
Type of poor road condition	N=95
loose gravel	26(27.4%)
slippery road	6(6.3%)
steep ascent	6(6.3%)
steep descent	24(25.3%)
Potholes	6(6.3%)
narrow road	10(10.5%)
hump or rough road	17(17.9%)

*Multiple responses, ** buttock, shoulder, pelvis, etc.

Table 3: Multivariate analysis of factors and vehicles involved in a road traffic accident.

Variables	Vehicles involved in RTA		AOR(95%CI)	
	Motorcycle n =213	Other vehicles n=210		
Accident location on the road	straight road	137	140	1.021 (0.443 2.354)
	Circle	18	14	1.180 (0.401 3.477)
	Junction	44	43	1.182 (0.471 2.964)
	cross road	14	13	1
Weather condition of the day	Sunny	112	101	0.504 (0.279 0.912)*
	fogy or cloudy	75	65	0.477 (0.258 0.879)*
	Rainy	26	44	1
Specific time of the day	Day	157	150	0.940 (0.575 1.536)
	Night	56	60	1
Traffic congestion or busy road	Yes	57	58	0.811(.511 1.289)
	No	156	152	1
Age of the victim	<35	167	167	0.994 (.609 1.622)
	35+	46	43	1
Geographical location of the accident	Urban	90	107	1.141(.755 1.726)
	Rural	123	103	1