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Management, risk factors and associated causes of road traffic accidents in Erbil city, Kurdistan- Iraq

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Abstract

Background and objective: Traffic accidents are a contributing factor to any loss of life, property, or services. It occurs when a vehicle collides with another vehicle or object. Certain elements will manifest, resulting in harm and potentially preventable incidents, and reduced by using the right strategies. These losses came from lower production and recovery costs. This study aimed to identify management, risk factors, and associated causes of traffic accidents in Erbil city.

Methods: This retrospective study was conducted from January 2008 to December 2023, in Erbil City, Iraq. Data was collected form national Incident monitoring system (NIMS) at directorate of Health, Erbil, KRG, Iraq. All acquired data were compiled until August 2020; thereafter, certain cases were excluded and not gathered due to the COVID-19 lockdown.

Results: A total of 41669 road traffic accidents were recorded during 2008-2023. A high incidence was found in 2023, and 2022 accounted for 4769 (11.44%), and 4613 (11.07%). While low prevalence was seen in 2012 (7.96%), 2015 (7.47%), 2016 (7.40%), 2014 (7.35%), 2013 (7.21%), 2018 (7.19%), 2017 (6.89%), 2021(5.96%), 2019 (5.04%), 2020 (4.66%), 2011 (3.10%), 2010 (3%), 2008 (2.45%), and 2009 (1.71%). Among all accidents with a high prevalence were car crashes (79.66%), followed by a lower prevalence of motorcycles (10.74%), pedestrians (7.53%), bicycles (1.91%), and car explosion (0.13%).

Conclusion: Human conduct is linked to a high rate of traffic accidents leading to injuries and fatalities. Road accidents have become a significant public health hazard. A new strategy for mitigating the seriousness of this issue is necessary.

Keywords: Road; Traffic; Accidents; Victims; Erbil; Iraq.

Introduction

Road traffic accidents (RTAs) every year worldwide roughly 1.35 million are killed or injured in automobile accidents and usually, about 3700 individuals die every day in fatal car accidents.[1,2] The majority of individuals are motorcyclists, car, and truck drivers especially those aged 15-69, who are at a higher risk for mortality.[3]

For example, in the United States, car accidents are a leading cause of mortality. In 2020 alone, about 40,000 people died in traffic accidents resulting in about 2.1 million emergency visits which led to $430 billion in medical costs, reduced quality of life, and loss of life.[3] Furthermore, the WHO estimates that road traffic crashes cost most nations around 10-25% of their budget.[5]

Road injuries are the eighth biggest cause of death across all age groups and it is estimated that by 2030, it is projected to be the seventh biggest cause of mortality globally.[6] Traffic management is to improve safety, speed, and comfort on current routes. Effective traffic laws and control mechanisms, along with well-equipped roadways, can improve safety.[7]

Traffic accidents are mostly caused by bad road conditions, irresponsible driving, sleepy driving, sleepwalking, drunkenness, sickness, mobile phone usage, and eating

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and drinking while driving. Inattention during a street collision might lead to a delayed response from others.[8]

With proper management and safety measures in place, traffic can move more smoothly and efficiently. Increased road capacity allows for larger traffic volumes. Orderliness also promotes increased traffic safety on the route.[9]

The Kurdistan area now has traffic congestion at peak hours in the morning and evening and becomes high load during holidays. Both metropolitan and suburban regions do not experience daily large-scale traffic congestion. However, several obvious indicators imply traffic congestion in the city is expected to rise due to rising demand.[10]

Traffic accidents can cause severe injuries to any portion of the body, regardless of vehicle type. Vulnerable regions of the body can lead to fatal and the main effects include the head, chest, abdomen, pelvis, and spine.[11]

A durable transportation strategy can improve individual health by limiting exposure to air pollution and its associated concerns. Furthermore, everyone has the right to obtain safe, nutritious, and cheap transportation. The government prioritizes promoting a healthy society through innovative and modern designs, as well as creating safe transportation infrastructure to reduce injuries and deaths from accidents.[12]

Socioeconomic status is a significant risk factor for road accidents. WHO research shows that road traffic accidents disproportionately impact low-income communities. Middle-income nations account for 90% of road traffic deaths, although having just 60% of the global car population.[13]

Middle Eastern and African countries have more traffic accidents than European countries. Even in high-income countries, low-income individuals are more likely to be involved.

Traffic accidents are a primary cause of mortality for children and adolescents aged 5-29. Another explanation is sex: males are more prone to young males under 25 accounting for 3 out of 4 road deaths (73%), three times greater than their female peers.[14]

Additionally, road design has a large influence on traffic safety. This ensures the safety of all road users, including pedestrians, cyclists, and motorcycles. It is extremely vital to consider the safety of all road users. When planning roadways. Traffic calming measures such as streets, cycling lanes, and safe crossings are crucial for reducing accidents among road users.[15] Unsafe automobiles that do not satisfy basic safety standards are crucial for preventing traffic accidents and reducing risks. Therefore, this study provides an overview of Management, Risk Factors, and Associated Causes of Car Accidents in Erbil City during 2008-2023.

Methods

Ethical approval:

The current retrospective study was performed after gaining Ethical approval by Medical research center committee at Hawler Medical University.

Data collection:

All information regarding car accidents were collected to know the main causes of road accident features of all victim outcomes (injuries/deaths) of road traffic accident types and ages of victims are recorded by the National Incident Monitoring System (NIMS) at Directorate of Health, Erbil ,KRG, Iraq. The fourteen years of data were from 2008 to 2023.

Statistical analysis:

Except in August 2020, no cases were collected due to COVID-19. For data analysis, Microsoft Excel and GraphPad Prisma (version 8) were used for data input and analysis.

Results

The overall results of traffic accidents were 41669 traffic cases recorded from 2008-2023. Among them, high prevalence was found in 2023 4769 (11.44%),

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4613 (11.07%) in 2022. While, lower prevalence was seen in 2012 3320 (7.96%), 3119 (7.47%) in 2015, 3087 (7.40%) in 2016, 3066 (7.35%) in 2014, 3008 (7.21%) in 2013, 2999 (7.19%) in 2018, 2871 (6.89%) in 2017, 2485 (5.96%) in 2021, 2104 (5.04%) 2019, 1943 (4.66%) in 2020, 1295 (3.10%) in 2011, 1253 (3%) in 2010, 1023 (2.45%) in 2008, and 714 (1.71%) in 2009 (Figure 1).

The high prevalence was car crashes 33194/41669 (79.66%), followed by the low prevalence was motorcycles 4477/41669 (10.74%), pedestrians 3140/41669 (7.53%), bicycles 800/41669 (1.91%), and car explosion 85/41669 (0.13%) (Figure 2 & Table1).

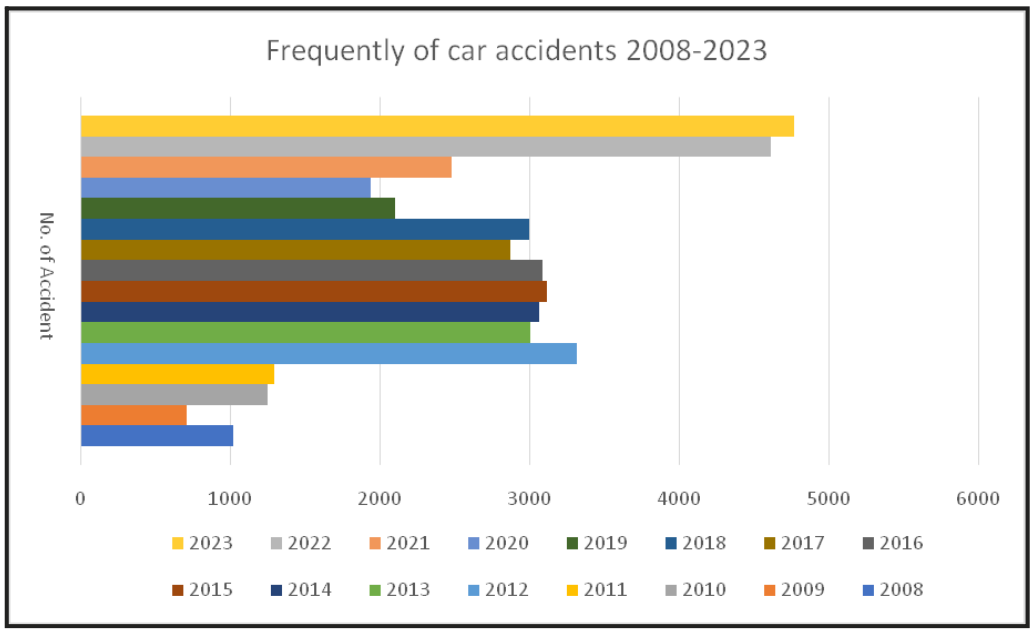

Figure 1 Number of traffic accidents during 2008-2023 in Erbil city

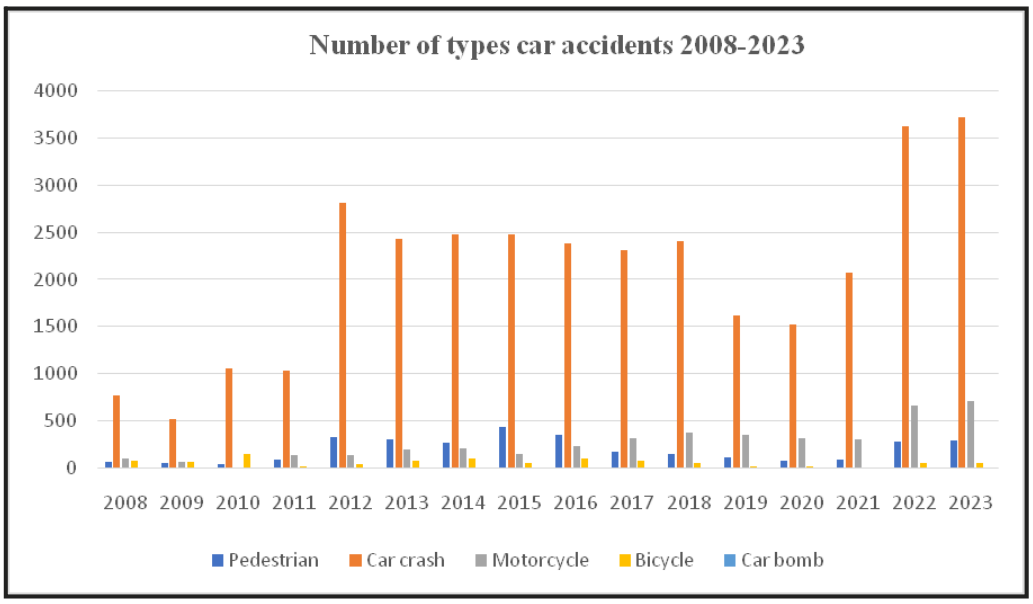

Figure 2 Number of different traffic accidents during 2008-2023 in Erbil city

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Table 1 Frequency and prevalence of road traffic accidents in 2008-2023 in Erbil city

Years	Car crash No. (%)	Motorcycle No. (%)	Bicycle No. (%)	Pedestrian No. (%)	Car explosion No. (%)	Total* No. (%)
2008	773 (75.56)	110 (10.75)	70 (6.84)	66 (6.45)	4 (0.39)	1023 (2.45)
2009	520 (72.85)	69 (9.62)	67 (9.38)	58 (8.15)	------	714 (1.71)
2010	1057 (84.355)	144 (11.49)	42 (3.35)	10 (0.83)	------	1253 (3)
2011	1039 (80.25)	143 (11)	18 (1)	93 (7.13)	2 (0.18)	1295 (3.10)
2012	2806 (84.51)	146 (4.39)	38 (1)	329 (9.90)	1 (0.03)	3320 (7.96)
2013	2423 (80.55)	198 (6.58)	76 (3)	309 (10.27)	2 (0.06)	3008 (7.21)
2014	2475 (80.68)	208 (6.80)	93 (3)	277 (9)	13 (0.38)	3066 (7.35%)
2015	2475 (79.35)	157 (5.03)	48 (2)	428 (13.72)	11 (0.35)	3119 (7.47%)
2016	2376 (76.96)	242 (7.83)	95 (3)	357 (11.56)	17 (0.55)	3087 (7.40%)
2017	2306 (80.32)	319 (11.11)	69 (2)	176 (6.13)	1 (0.03)	2871 (6.89%)
2018	2406 (80.22)	375 (12.50)	56 (2)	159 (5.30)	3 (0.10)	2999 (7.19)
2019	1617 (76.85)	357 (16.96)	15 (1)	115 (5.46)	------	2104 (5.04)
2020	1524 (78.75)	318 (16.30)	15 (1)	86 (4.20)	------	1943 (4.66)
2021	2069 (83.25)	310 (12.47)	3 (0.12)	99 (3.98)	4 (0.16)	2485 (5.96)
2022	3618 (78.43)	669 (14.50)	45 (1)	281 (6.09)	-------	4613 (11.07)
2023	3710 (78)	712 (14.90)	50 (1)	297 (6.10)	-------	4769 (11.44)
Total	33194 (79.66)	4477 (10.74)	800 (2.16)	3140 (7.63)	58 (0.13)	41669 (100)

*Column % was calculated.

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Discussion

The statistics indicate that the number of car accidents in Erbil city from 2008 to 2023 was 41,669 occurrences, high prevalence was found in 2023 4769 (11.44%), and 4613 (11.07%) in 2022. While, lower prevalence was seen in 2012 3320 (7.96%), 3119 (7.47%) in 2015, 3087 (7.40%) in 2016, 3066 (7.35%) in 2014, 3008 (7.21%), 2999 (7.19%) in 2018, 2871 (6.89%) in 2017, 2485 (5.96%) in 2021, 2104 (5.04%) 2019, 1943 (4.66%) in 2020, 1295 (3.10%) in 2011, 1253 (3%) in 2010, 1023 (2.45%), and 714 (1.71%), respectively.

Among all accidents, the higher prevalence was car crashes 33149 (79.66%). However, the low prevalence was from 4343 (10.74%) motorcycles, 3182 (7.63%) pedestrians, 902 (2.16%) bicycles, and 85 (0.13%) car explosions.

The car crash according to our collected data considered a major traffic case in road accidents in Erbil city, accounted for 33149 (79.66%) cases recorded. According to WHO, every year approximately 1.19 million car crashes happen worldwide.[16] Twenty to fifty million people suffer from either fatal or non-fatal injuries, or some may lead to disability. According to the Iraqi government and KRG media since 2022 more than 10000 car crashes have happened every six months in all Iraq cities. According to Joni et al.,[17] the number of traffic accidents catastrophically grew in number during 2017 reaching 21% in Iraq. Moreover,[18] report that in their study in Turkey, the only main method of car crashes was due to drive fault which led to increased traffic crash severity.

The high prevalence of car crashes due to the use of cars in numbers by people in our region according to the Kurdistan Regional Government (KRG) estimated near 3 million cars are present in our region and this huge amount number of cars may play an important role for making accidents in our region due to using in routine daily uses and traveling by their car by individuals.[19]

Another reason our region still didn't have many quality routes between cities and inside the city center, was due to one-way roads almost all car crashes may happen due to the classic driving by drivers and narrowing the road size, having many dumpers, holes, bad quality surface course, base course, and road lines. Despite, the cause of bad quality roads, KRG still plans to make new roads of standard quality.[20]

Driving type also plays an important role in those accidents due to fast driving especially overdriving speed more than usual. However, in past years traffic police have tried to minimize those speeds by planning a road camera and radars as well as point-to-point radar systems to pay attention to unusual speed drivers on highways and inside cities and those having that bad idea will be afraid of having traffic punishing and receiving high traffic taxes.[20]

The second most common accidents were 4,343 (10.42%) motorcycle incidents, attributed to the rising utilization of motorcycles owing to their affordability and the desire to evade congestion and traffic burdens within the city.

Another explanation is that Erbil city was experiencing significant growth, leading to a spike in restaurant and fast-food patrons, with deliveries exclusively conducted by motorbikes. The population comprises persons of various nationalities, including Syrian refugees, Iranians, and South Asians, particularly Indian and Bangladeshi workers. Motorcycle accidents result in severe injuries attributable to the absence of protective helmets, with a significant proportion of riders being young and prone to excessive speed.

Pedestrian and bicycle accidents accounted for 3182 (7.63%) and 902 (2.16%), the majority of victims were women, children, older, and students due to car drivers driving fast inside allays and near street lines, and at school zones. Ultimately, car explosions occurred in only 85 instances (0.20%), predominantly

resulting from terrorist attacks or bomb deployments by suicide operatives, particularly ISIS, between 2014 and 2019. Additional incidents were attributed to military drone strikes by Iranian and Turkish forces targeting PKK individuals or due to errors. Due to demographic changes, there have been some variations in the risk variables for road traffic accidents, and disparity in time and way of life which is unavoidable given the diversity of global civilizations.

Conclusion

Human conduct is linked to a high rate of traffic accidents leading to injuries and fatalities. Road accidents have become a significant public health hazard. A new strategy for mitigating the seriousness of this issue is necessary.

Competing interests

The author declares that he has no competing interests.

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