Characteristic of Car Crash in North of Iraq

Huseyin Gökçekuş, Shahban Ismaael Albakra, Muhammad Khidre Musa

Abstract: Road Traffic Accidents (RTAs) are a significant predicament in idiom of fatality and morbidity confronting the road clients just as the Vehicles transportation and road specialists. The Iraqi populace has expanded by 45% and numeral of vehicles by 3 times during last 18 years. Subsequently, these enhancements were sadly joined with ascending the car crashes numeral, death and grimmness. Besides the compassionate catastrophes, consistently, there are significant financial mislaying in north Iraq because of the pandemic of RTAs. predetermed the essential of comprehension, the synergetic agents identified with RTAs for the usage by congestion vehicles and road specialists to ameliorate the road safety road auto collisions are incidents that abruptly, unintentionally and out of the blue happen under unanticipated conditions that include in any event one mobile car and consequence in at least one road clients being slaughtered or harmed. Road auto collisions are difficult to annihilate. In any case, their commonness can be decreased to the minimum degree by means of intermittent appraisals of auto collision attributes and the most significant viewpoints for road administration to think about when structuring, planning and assessing the implementation of a road to recuperate transportation and road clients’ safety. Thus, the essential target of this study is to assess car crashes in north of Iraq utilizing a review investigation of mishaps that happened from 2016–2018 mulling over the accompanying parameters: the reason for the mishap, sort and the number of vehicles engaged with the mishap, the hour of the mishap, the seriousness of the mishap, the kind of mishap and the drivers age.

Keywords: north of Iraq, accident, traffic, road safety, fatality.

I. INTRODUCTIONS

Road traffic crashes (RTAs) represent universal wellbeing, financial and social emergency. They are viewed as a very confused scourge since they are influenced by an assortment of components, for example, design of high way, driver conduct and human factors, speed limits, vehicle capacities, and natural conditions. Internationally, as indicated by the World Health Organization (WHO) about 1.25 million individual’s death every year because of RTAs. Generally, 85% of these passing are happened in progress nations. At regular intervals each four hours, somebody insufflate and in any event, three individuals are harmed because of a RTA in Iraq. As per a WHO report gave in 2015, Iraq is positioned eighteenth out of 180 nations as far as the absolute number of RTAs in 2013 (5,789 mishaps); India possesses the top position (137,572). Numerous countries have evaluated the qualities of auto collisions to diminish the size of misfortunes brought about [1]. Road traffic is the main reason for death universally, in front of diabetes, tuberculosis, intestinal sickness and all other damage classifications [2]. Indeed, even in strife influenced nations, for example, Afghanistan, Libya, Pakistan, and Yemen, road traffic stay the most prevalent Factors of damage casualty, lead to somewhere in the range of two and multiple times a larger number of fatalities than powers of war and legitimate interposition[3]. According to the evaluation of WHO, the traffic casualty rate to be the second most significant rate in the Eastern Mediterranean Region (EMR ) universally after the African area and expanding in a some of the nations in the area [4]. Inside the EMR Iraq has the 2nd maximum amount of road vehicle congestion casualty [5].

Iraq is one of the significant Arabic nations with the absolute region in access of 169112.75 mile2 and all out populace of around 37 million. Nearly 70% of them inhabit in urbanized nearly regions. Engine vehicle crashes lead to more than 1.2 million gassings over the world and a much more considerable number of non-deadly wounds every year adversely influencing the wellbeing and prosperity of driver damage survivors and their families [6]. Expanding paces of transportation accident casualties in the EMR have been ascribed to an absence of extensive road security enactment, unpredictable road safety reviews, and quick motorization [5]. Somewhere in the range of 2007 and 2010, the number of enrolled vehicles in the EMR expanded by 15 % to more than 60 million vehicles .In Iraq, importing of vehicles spiked after the finish of monetary authorizes in 2003 and has kept on expanding in spite of the delicate security circumstance. Roughly one out of ten individuals possess a vehicle in Iraq [4].

Car accidents are the main source of passing in the north of Iraq [3]. As indicated by the Ministry of Health in the north of Iraq, car accidents murder 3 individuals and harm 28 individuals day by day in the north of Iraq (NOI), which implies around 850 passing and 10,000 wounds every year [3], nevertheless, as claimed by information of the General Directorate of Traffic (GDT), from 2014 as far as possible of 2016, 2449 individuals were slaughtered in car accidents (16.12 passing/100,000 individuals) and 35,222 were harmed (231.8 wounds/ 100,000 individuals) in the locale[7].

The danger of being murdered or harmed in an accident is a lot higher on thruways and in certain locales than in others, as street security fluctuates over the NOI. Somewhere in the range of 2010 and 2013, the / had the most elevated number of casualties in contrast with different areas in Iraq. The most elevated pace of road car crash wounds and victims is in Erbil [7]. In the view of the insights revealed in the World Health Organization (WHO) report in concerning to worldwide condition of road safety[1]. Figure 1 has been created to contrast the accident death pace of Iraq all-inclusive and territorially.
The car crashes the death rate in Iraq in 2013 is 20.2 per 100,000 individuals. Internationally, this rate is relatively higher than the overall pace of 17.4. In addition, as per the WHO report Iraq positions 113th in the worldwide rundown in which Monroe positions first with zero death rate and Libya positions 180th (last) with 73.4 death rate. regionally, as compared to with its 6 circumscribing nations, Iraq situated as the middle with casualty rate (20.2) are simply under the mean pace of 20.6[4]. Roughly eight out of ten road traffic fatalities in Iraq were guys. The ratio of guys among road traffic injuries (RTI) casualties describe from Turkey (77 %), Iran (79 %), Lebanon (77 %), Jordan (81 %), Egypt (80 %) and Emirates (89 %), show so analogous the template same as examples, recommending that guys are excessively influenced internationally, more than seventy-five percent of road traffic victims are male. Sine gender dispersion of RTAs mortality in Iraq is like worldwide and territorial examples, the age appropriation is to some degree unmistakable. Among guys, the quantity of road traffic mortality topped among the lifetime bunches somewhere in the range of 15 and 34 years old; anyway amongst females, the number of losses was most noteworthy in the under-five age gathering. A high extent of wounds among youthful grown-ups has been recorded in numerous specific situations; in any case, the high number of losses among little youngsters is an eminent quirk in statistic profile of RTAs [2].

![Fig. 1. Highway coincidence casualties pace for chosen Countries [1]](image)

II. LITERATURE REVIEW

Road accidents are one of the most relevant problems in today's humanity. Every year 1.24 million people die in road accidents around the world. Road congestion collisions are one of the fundamental basic issues for human life. In spite of boundless measures being utilized to govern and limit this issue, road traffic collisions are confronting a developing pattern, step by step. As per WHO announcement on road safety for 2015, road traffic collision lead higher than 1.25 million passings every year and enormously affect human life and improvement. Broad studies have been directed identifying with the statistic parts of road accidents and framework investigation in created nations. Sadeghniat et., al.(2015) Studied the connection between a traffic accident and sleepiness and showed that the danger of road mishaps brought about by sleepiness indicated a critical increment during the lowermost spot of vigilance of biological time (0:00-6:00) as contrasted and other period of daytime. Likewise, the outcomes demonstrated most road mishaps happen at hours with top traffic congestion and the mishaps are decreased at the duration with small traffic congestion. The result obtained indicated that there is an incredible need to advise drivers about the side effects and outcomes of drowsiness [8]. Rolison et., al. (2018) evaluated the reasons for road mishaps including youthful, centre age, and more seasoned male and female drivers detailed in mishap records and contrasted these and master outlook on policeman and lay perspectives on the driving open. These outcomes point to deficiencies in how law implement researches driver interruption, medication and liquor disability, what’s more, errant or imperfect visual understanding, also further recognize a necessary for contributing component recorded in mishap reports to be incessantly investigate and reinvigorate to guaranty that mishap measurements mirror the whole realm of factors that add to road mishaps [9]. Jrew et., al. (2018) indicate some assessment on traffic crash for fundamental urban road in Erbil and represented that increment the of speed quieting (mounds or knocks) will expand the number of property harms at that point increment the auto collision rates and increment in the street segment length will build the number of complete mishaps and increment the number of property damages[10] (Jrew et. al., 2017).Ahadi et., al.(2016) they used the in their research Human Capital method to evaluate the cost traffic accident in Iran[11]. Mohammed et., al.(2018) utilized GIS for analyzing traffic accident locations and also by using SSPS program by statically analyzing and some outcomes were recorded. Utilization of mishap recurrence strategy may be uncomplicated to specify difficult to decide the dangerous areas yet it ignores the mishap seriousness [12]. Leidman et., al.(2016) by the information from the Iraqi Injury Mortality supervision arrangement gave a nitty-gritty image of the weight of road traffic casualties in Iraq[5]. The most noteworthy quantities of road vehicle congestion losses were among youngster. Walkers also, other defenceless street clients represented a portion of street traffic fatalities and for even, a more prominent extent among ladies and children. Cioca et., al.(2017) expressed that the drivers matured somewhere in the range of 26 and 45 are associated with most street mishaps. Additionally, men were associated with 75% of street mishaps, most of the RTAs are brought about by low-gifted drivers, with under six years of driving experience [13]. Farag et., al. (2014) fulfilled statistical investigations of auto collisions that happened in the road system in Dhofar inside the sultanate of Oman. The evaluation was done utilizing mishap frequencies and mishap rates. The outcomes disseminate a decline in the all outnumber of mishaps during the investigation time 2007–2010[14]. Touahmia and Mabrouk. (2018) analyzed the fundamental driver of Road traffic accidents RTAs in the territory of Hail in Saudi Arabia using questioners. It was discovered that 67% of RTAs result from human components, 29% from street conditions and 4% from vehicle abscons. Likewise, the creator expressed that the over the top speed and infringement of traffic rules and guidelines were the fundamental driver of RATs [15]. Albayati and Latief. (2019) gave some outcomes and
explained that 12,019 RTAs happened in the capital of Iraq: generally, 1,092 RTAs happened every year. 22% of the RTAs brought about death, 67% brought about damage and 6% brought about the two passing’s and wounds. Just 4% of the RTAs brought about property harm without exploited people. To this end, Baghdad has the most noteworthy predominance of RTAs of all Iraqi governorates [16].

A new report by Albayati and Latief. (2018) determined car crash information in Iraq from 2005–2015. These creators detected that 109,067 mishaps happened during the investigation time frame; the biggest number of mishaps (10,709) happened in 2013. The specialists expressed the run-overs were the most noticeably terrible kind of mishap, which represented 45.7% of mishaps. Crashes represented 43.3% of mishaps, inferred that 72% of mishaps were because of the drivers, 11% were expected to the vehicle(s), 7% were because of people on foot and 6% were because of the roads[2]. Al-Jameel, Hamid Ahab. (2016) was built up an Expert framework for a road traffic accident that gives master discussion in the area of Iraqi road safety. The framework comprised of 2 stages. The 1st is the analytic stage and the subsequent step is the curing stage. The goal of the created master framework was to decrease the quantity of RTA [17]).

III. STUDY REGION AND DATA COLLECTION

The North of Iraq (NOI) is a part of Iraq comprises of four provinces, Erbil, Dohuk, Halabja and Sulaymaniyah, and two other administrations (Garmean and Rapain) has a population nearly 6 million. As per the Ministry of Health in the NOI, car accidents slaughter 3 individuals and harm 28 individuals every day in the NOI, which implies around 850 passing and 10,000 wounds yearly. Information as stated by the General Directorate of Traffic (GDT), from 2014 as far as possible of 2016, 2449 individuals were executed in car accidents (16.12 passing/100,000 individuals) and 35,222 were harmed (231.8 wounds/100,000 individuals) in the locale. And in the north of Iraq, 4 different zones are elected for 3 years for this investigation Graphically is introduced in Figure 2.

![Image](https://example.com/image.png)

Fig. 2. The Study Area, North of Iraq

The information introduced here was acquired from the Region General Director of Statistics Office (GDS) in the Ministry of Planning in the north of Iraq and relate to the period 2016–2018. The gathered information incorporate the number of mishaps, the number of wounds and passing, the kind of mishaps, the seriousness of the mishaps, the sort of roads, the reasons for the mishaps, the time of the mishaps and the vehicle’s type (s) included. By and large, when a car crash happens traffic police will go to the area of the mishap and set up a mishap report, which incorporates an outline of the mishap and data about the area, the date and time, climate conditions, the sort and permit number of the vehicle(s), the reason and kind of the mishap, the sort of street and the quantity of wounds and additionally passings. A duplicate of the mishap report is put away in a close-by police headquarters. All accident are categorized by monthly, daily, location, types and number of injured and fatality for 2016-2018 for Erbil, Sulaymaniyah, Dahok and Garman administration.

IV. RESULT AND DISCUSSION

Tables 1-3 demonstration the paces of various sorts of mishaps in the north of Iraq during the surviive time frame (2016–2018). It is self-evident that the most widely recognized kind of RTA is a crash or collision, which represented about 61.4% of the all outnumber of RTAs. The second most normal sort of RTAs was Turnovers, which represented roughly 18.46 % of RTAs While the Run-over comprised about 16.4 % of RTAs. Additionally, other types of a road traffic accident for example, vehicle fire or a vehicle tumbling down a slope into a stream indicates as 3.74% of. To better comprehend the degree of peril related with each kind of RTA, information was gathered about the casualty rate for each sort of RTA (collision, Turnovers, Run-over and other); the results appear in Tables 2 and3. Considering the outcomes appeared in Tables 2 and 3, it appears that the most prevalent kind of RTA is the most perilous one The most noteworthy casualty rate for the collision or impact mishap type is represent (5.7% v death and 54.97% without death) is this kind of accident take place since a vehicle slammed into another vehicle the turnover is the second most perilous mishap that consists about (3% killing and 16% injured) the turnover mishap means toppling of a vehicle. The third sort which represents casualty pace of 3.6% murder and 13% wounded is run-over ascribed to the immediate contact between the vehicle and the passerby engaged with the mishap which., the remaining part is consist of 0.17% o murder and 3.5% injured.
A. Accident Numbered

There were 12,475 RTAs from 2016–2018 in North of Iraq; patterns identified with this coincidence and the yearly normal number of RTAs are displayed in Figure 3 and Figure 4. The most modest number of RTAs happened in 2017.). Then the numbers of accidents increase in 2018 merits referencing that the years following 2012. This circumstance might be because of the dynasty of legislative estimates concentrated on tending to the issue of expanding RTAs inside the interstate system in the north of Iraq. One of them, the "even and odd strategy," was received to diminish clog on the highway system during top hours; vehicles with tags finishing with a pair plate numeral are allowed to driving on even schedule daytimes; vehicles with tags finishing with an odd plate number can drive on odd schedule days. Another legislative measure was constraining heading to those drivers who had a driver's permit. This measure anticipated young people just as other unapproved people from driving. There are potential methods for diminishing highway mishaps Firstly, A political will and responsibility by all built up association concerned to manage road auto collisions. All law implement organizations should deliberately work to uphold traffic the standards and guidelines on all drivers. It must be responsibility without partiality. Secondly. A precise arrangement and plan including training, designing and implementation to lessen the pace of mishaps. Thirdly, Transport specialists must have a similar objective to diminish the high pace of mishaps and the strong excitement to carry it to the real world. Fourthly. A strong arrangement with particular measures for execution and ministration must be doing. Fifth. There must be a powerful consonance inside and among various degrees of government and with exclusive performers. Sixth. Cautious and basic assessment of measures and their effectuality to attain the ideal objective. Seventh. There must be a road security strategy to gain this objective. Eighth, the across the board idea of depravity generally in Africa, among the administration authorities eg. the Police, Vehicle Inspection Officer (VIO), and so forth should be investigated. Ninth, Perceiving road the car crashes as the craftsmanship of man and not as an issue of destiny. Tenth, seeing all mishaps because of human blunders are preventable if there is a sure change in our frame of mind toward road security.

B. Intensity of Accidents

The seriousness of mishaps can be subdivided into four gatherings: deadly (in any event one casualty lost their life),

![Fig.3. Accident Number according to the city](image_url)

![Fig.4. Accident Number according to the Types of Accident](image_url)
injury (either light wounds or genuine wounds), deadly and injury (counting the two sorts noted above) lastly "no victim" (no fatalities or injured victims). Among the 12475 RTAs that happened during 2016–2018, 12.5% of RTAs were recorded as deadly mishaps and 70 % were write down as injury mishaps, the most exceedingly terrible sort of RTAs, which is deadly and damage, represented 10.5% of mishaps. 7% of RTAs were of the "no victim" type, the sexual of victims for fatal as well as injury type RTAs, clearly the casualty pace of guys was multiple times that of females. For the damage kind of RTAs, guys endured approximately 73% more much of the time than females. This discovering mirrors that guys are increasingly able to participate in dangerous driving practices (e.g., driving forcefully) than females. Another conceivable clarification for the above outcomes is the extent of male drivers, which is a lot higher than that of female drivers in north Iraq. Hence, guys are bound to be engaged with RTAs than females.

C. RTAs Based on Causal Factors

Figure 5 denoted the level of mishaps dependent on causal components during the period 2016–2018 in the north of Iraq. The reasons for mishaps can be separated into six essential classes: drivers, the roads, the vehicle, walkers, travelers and others (e.g., creatures or hindrances). The biggest commitment to the event of mishaps is drivers, who represent 76.2% of mishaps. This finding might be ascribed to one of the accompanying variables: rebelliousness with laws and traffic wellbeing guidelines, surpassing the posted speed limit, driving affected by medications or liquor. For example, in spite of the fact that the neighborhood guidelines express that as far as possible for an urban street is 65 kilometer per hour, this breaking point is authorized distinctly about 30%. Similar issues are adding material to cap utilize for cruiser drivers and safety belt use for vehicle drivers the implementation levels are just about 20% and a half for these issues. The second most exceptionally positioned causal factor for RTAs is the vehicle, which represents 14.1% of mishaps. Absence of standard support for vehicles may prompt unexpected imperfections in a vehicle's stopping mechanism; deficient front or backlights can likewise add to RTAs in the north of Iraq. Walkers traverse parkways instead of utilizing crossing lines or footbridges results in about 5.89 % of RTAs is the third main factor. Poor parkway basic conditions in certain segments of the roadway arrange (e.g., the nearness of extreme rutting, which can cause lost controlling control) and the presence of ill-advised geometric plan (e.g., the presence of sharps bends or the nonattendance of some of the guidance ahead of time or request traffic signs) are answerable for positioning road fourth at 2% as far as causing RTAs. The rest of the reasons for RTAs comprise of travelers and "different elements," every one of them establishing about 2% of RTAs (i.e., the most minimal contribution rate contrasted and different causes).

D. RTAs Based on Light Conditions

Lighting status significantly impacts on RTAs. Figure 6 illustrated the level of RTAs that happen during the four lighting states of the day for the term 2016–2018 in the north of Iraq. The most elevated level of car crashes happened throughout sunlight status (58%). This finding might be credited to the way that the great many people work and in this manner drive during the day, bringing about an enormous number of outings out and about road system. It is likewise obvious from Figure 6 that 33.46% of RTA happen around nigh time, which might be viewed as generally low given the related comparatively confinements during obscurity. Although, few autos are out and about during the night too. The frequency of RTAs during nightfall (3.5%) is smaller than that during dawn (4.9%) because maybe to the effect of fatigue and sleepiness early morning.

E. Month Distribution of RTAs

The month to month conveyance of RTAs appears in Figure 7 and Table 4. It is clear that the long stretch of December was related to the most minimal pace of RTAs; it plays a
part in approximately 6.77% of a year's complete RTAs. Then again, the recurrence of RTAs topped at 11% in August. This finding might be credited to extra excursions related to the start of the scholarly year. The normal number of RTAs during the most recent four months of the year comprising 8.52% of the year's all-out contrasted and generally 8.24% for the initial eight months.

F. RTAs Based on Vehicle Type

Table 8 represents the contribution paces of various vehicle kinds in RTAs for the research time frame (2016–2018) in the north of Iraq. Traveler vehicle which includes buses, the essential kind of conveyance in the north of Iraq, were engaged with 74% of all RTAs that happened during the investigation time frame. Trucks were engaged with 5.5% of RTAs, and motorcycles were associated with 3.1%. Other vehicle types (e.g., horticultural or development vehicles) were engaged with generally 17.9% of RTAs.

G. RTAs Based on Highway Functional Class

 Classified road as a three main group a comprises of local, sub road, main roads. Each kind of road has distinctive traffic conditions and geometric specifications. Table 5 indicates the appropriation of RTAs dependent on roads kinds. Most of RTAs (73.36%) happened on minor arterial ways. This class of interstate has a high geometric structure and planning specifications that empowers fast and a high volume of traffic. These angles increment the likelihood of a mishap; most of the transporting pattern in the north of Iraq comprises of this kind of interstate. Collector road was related to the second most noteworthy pace of RTAs: it represented 20.8%. A portion of these sorts of roads are answerable for connecting different part in the north of Iraq; the high traffic volume joined with the high level of trucks that utilization this kind of roadway, brought about a generally huge number of RTAs. Local roads or rural represented 5.8%.

Table 5: No. of the accident according to the Road classification(2016-2018)

| Road types       | No. of accident | % no. of accidents |
|------------------|-----------------|--------------------|
| Main road        | 9152            | 73.36              |
| collector road   | 2594            | 20.8               |
| Rural            | 728             | 5.8                |
| Total            | 12474           | 73.36              |

H. Fatality and Morbidity

RTAS have a horrendous effect on people, social orders and nations. In Iraq, around 29415 people died throughout from 2002 to 2015, in addition to 106259 people are subjected to morbidities because of the RTA. Depending upon casualties’ information displayed in Table 6 the yearly normal quantities of loss of life and morbidities during 2016-20118 are 2020 and 20412, individually. Reviewing to the mind that the quantity of mishap inside this period has a yearly normal of 7790, it very well may be effectively deduced in every one mishap the death rate was 0.16 (each 6.1 mishaps brought about one passing) though the morbidity rate was 1.63% during 2016 to 2018 as showed in Table 9. Universally, about multiple times more male than female passed on because of streetcar crashes (WHO, 2013). In Iraq, the demise feasibility for male because of auto collisions more than female by roughly multiple times, a
similar figure shows that the presentation for grimmness because of car crashes for the male is greater than that for female by 62%.

**Table 5: No. of death and injured in the north of Iraq (2016-2018)**

| year | Deaths | Injured |
|------|--------|---------|
| 2016 | 685    | 8578    |
| 2017 | 630    | 6660    |
| 2018 | 705    | 5174    |
| Total| 2020   | 20412   |

V. CONCLUSION

12475 traffic accidents occurred in the north of Iraq during (2016-2018); where the maximum rate is occurred 35.8% while the minimum of RTAs was recorded in 2077 which it was 31.7%. the 1563 RTA caused death and 10912 without death.

Among the 12, 475 RTAs that throughout the interval 2016–2018, 12.5% of them were related to casualties and 70% were related with wounds. The RTAs, which incorporate deadly and damage, represented 10.5% of mishaps. 7% of RTAs were of the sort “no casualty.”

The collision was the most popular sort of mishap during the investigation time frame. This sort of mishap comprised generally 60.68% of all RTAs; Turnovers Run overrepresented 18.82% of mishaps. Run overrepresented 16.81% of RTAs. And other types represent 3.66%.

Drivers were the essential reason for RTAs: they represented 76.2% of the all outnumber of RTAs from 2016–2016 in the north of Iraq. Vehicles represented 14.1% of RTAs. road and people on foot represented 2% and 5.89% of mishaps, individually.

The rate of Males was multiple times greater in dies in RTA than females. Males additionally had a 73% higher pace of presentation to damage than females.

Road car crashes are slanted toward including individuals in more youthful age gatherings; the mean period of individuals who pass away or were harmed in RTAs was 26. Thirty percent of RTAs were related with individuals matured 24–29 years, trailed by individuals in the 30–35 age gathering (23.5%), and the 19–23 age gathering (18%).

Concerning the light situation, 58% of RTAs happened within sunshine hours. 33.46% happened pending the night. Likewise, 3.5% and 4.9% of RTAs happened pending the times of nightfall and dawn, separately.

December showed the fewest number of RTAs. Generally, this month facilitated about 6.77% of RTAs; the pinnacle number of RTAs happened in October (i.e., this month facilitated, all things considered, 10.18% of RTAs).

Almost 74% of RTAs were brought about by traveler vehicles which include buses. Trucks were associated with 5.5% of RTAs. Other vehicle types added to about 20.5% of RTAs. Road practical kinds had a significant effect on the circulation of RTAs. Generally, 73.36% of RTAs happened on the main road. sub roads represented 20.8% of the absolute number of RTAs; rural roads contributed 5.8% of the all outnumber of RTAs.

REFERENCES

1. World Health Organization. Global status report on road safety 2015. World Health Organization, 2015.
2. Albayati, Amjad Hamad, and Roaa Hamed Lateif. "Statistical Analysis of Mortality and Morbidity Due to Traffic Accidents in Iraq." Journal of Engineering 24, no. 1 (2018): 20-40.
3. Rudaw., “Traffic Accidents Leading Cause of Death in the Kurdistan Region”. Accessed February 20, 2018. http://www.rudaw.net/english/kurdistan/29042017
4. Asad, Firas Hassan Alwan. "ROAD TRAFFIC ACCIDENTS IN IRAQ: A REVIEW OF EVIDENCE-BASED LITERATURE." International Journal for Traffic & Transport Engineering 7, no. 2 (2017).
5. Leidman, Eva, Maret Malinak, Abdul-Salam Saleh Sultan, Ahmed Hassan, Syed Jaffar Hussain, and Oleg O. Bilukha. “Road traffic fatalities in selected governorates of Iraq from 2010 to 2013: prospective surveillance.” Conflict and health 10, no. 1 (2016): 2.
6. World Health Organization. Global status report on road safety 2013: supporting a decade of action: summary. No. WHO. NMH. VIP 13.01. World Health Organization, 2013.
7. Jaff, Dilshad. "A public health initiative to address road traffic accidents in the Kurdistan region of Iraq," World Family Medicine Journal: Incorporating the Middle East Journal of Family Medicine 99, no. 5832 (2018): 1-5.
8. Sadeghniat-Haghighi, Khosro, Zohreh Yazdi, Mohsen Moradinia, Omad Amanian, and Alireza Esmail. "Traffic crash accidents in Tehran, Iran: Its relation with circadian rhythm of sleepiness." Chinese journal of traumatology 18, no. 1 (2015): 13-17.
9. Rolison, Jonathan J., Shirley Regev, Salissou Moutari, and Aidan Feeney. "What are the factors that contribute to road accidents? An assessment of law enforcement views, ordinary drivers’ opinions, and road accident records." Accident Analysis & Prevention 115 (2018): 11-24.
10. Jrew, B., Msallam, M., Khaled, S. and AbuJaradah, M., 2017. “Analysis of and evaluation of traffic accidents for principle urban streets in Arbil city in Iraq”. Diyala Journal of Engineering Sciences, (2017) 10(1), pp.118-131.
11. Ahadi, Mohammad Reza, and Hosamoddin Raz-Ardakani. “Estimating the cost of road traffic accidents in Iran using human capital method.” International Journal of Transportation Engineering 2, no. 3 (2015): 163-178.
12. Mohammed, Hussein D., Abbas M. Ahmed, and Heba A. Ahmed. "Statistical Analysis of Traffic Accidents Locations Using Geographic Information System in Darbandikhan Town-Kurdistan Region of Iraq.”
13. Cicoa, Lucian-Ionel, and Larisa Ivacu. “Risk indicators and road accident analysis for the period 2012–2016.” Sustainability 9, no. 9 (2017): 1530.
14. Farag, Siham Gaber, Ibrahim H. Hashim, and Saad A. El-Hamrawy. "Analysis and assessment of accident characteristics: case study of dhofar governorate, Sultanate of Oman." Int J Traffic Trans Eng 3 (2014): 189-98.
15. Tosahmaiia, Mabrouk. "Identification of risk factors influencing road traffic accidents." Engineering, Technology & Applied Science Research 8, no. 1 (2018): 2417-2421.
16. Albayati, Amjad H., and Israa Mahdi Lateef. "Characteristics of Traffic Accidents in Baghdad." Civil Engineering Journal 5, no. 4 (2019): 940-949.
17. Al-Jameel, H.A., “Reducing the Number of Accidents in Iraq by Using Expert System”. Journal of University of Babylon, (2016). 24(4), pp.1099-1112.