Road Traffic Accidents and Associated Risk Factors in Erbil, Iraq: Retrospective (2017-2019) Households Based Study

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ABSTRACT

Background: Road traffic accidents (RTAs) are of major concern to the general public in the world. Annually 1.3 million people die from highways, and the rate of these accidents is higher in adolescent and males. A number of factors contribute to the increase in these accidents, including the type of vehicle and its speed, the quality of roads, weather and driving skills. As well as influencing factors, including alcohol or medication, and behavior, especially aggressive driving, distracted driving, impulsiveness and street athletics, this study aimed identifying the prevalence pattern of road traffic accidents (RTAs) in Erbil city between 2017-2019.

Methods: A descriptive cross-sectional study was conducted in six municipalities chosen from 37 district of Erbil, and 3743 persons made direct randomly interview in each process of the study from March -15th November 2021. Using Chi-Square detect the association between sociodemographic features and previous road traffic accidents victim at level of significance of p<0.05.

Results: Out of 3743 individual 675(18%) had been made road accident, the year 2019 reported highest rate 313(46.4%) of street accidents, in Summer 265(39.3%), significant association founded between previous road accidents and gender, marital status, educational level and occupation, male single, student young age highest rate reported of accidents. Finally, the most causes factors of road accident were reported distraction 153 (22.7%) followed by careless nearly by one-fifth133(19.7%).

Conclusion: A significant association founded between human behavior (distraction, careless), sociodemographic features (age, gender, marital status, education, and occupation) and road traffic accidents.

Keywords: : Road, Accidents, Study, Erbil

INTRODUCTION

A huge worldwide public health fear as a result of increasing occurrence, related disabilities and deaths, financial and social consequences is Road traffic accidents (RTAs) represent, worldwide its results responsible about nearly 1.3 million people every year[1]. More than half of all deaths of highway are among susceptible street users: motorcyclists, cyclists, and pedestrians. 93% of the world's mortalities on the streets happen in low- and middle-income nations, although these nations have nearly 60% of the biosphere's automobiles. Injuries of road are the sources of death for young adults and children aged 5-29 years[2]. Day by day road traffic accidents thought be risen and its believed that the total number of road injury fatalities increased considerably from 1.2 (UI 1.0 to 1.4) million in 2000 to 1.3 (UI 1.0 to 1.6) million in 2019[3]. In developing countries road accidents considered one of the foremost reasons of death principally in the low-income nations and because of the seriousness of the condition, the safety of road research is essential in these nation state to identify applied explanations to this subiect[4]. An autonomous region in the north administer by the Kurdistan Regional Government (KRG) named The Kurdistan Region of Iraq (KRI) composed of four governorates, its capital Erbil[5]. Between 2010-2013, Erbil had the highest quantity of mortalities in comparison to other cities in Iraq (Leidman et al., 2016)[6] which reported that pedestrians proportion composed less than half (49.2%) of mortalities.

Among female and children, the common of road traffic mortalities were walkers, 56.6 % and 69%, separately. Proportions of highway traffic mortalities limited between 8.6-10.7 per 100,000 populations. Numerous research done in the field in Iraq and KRI like Leidman et al., (2016), Mohammed et al (2019) mentioned many challenges faced KRI like rules and regulations, guidelines problem; absence of exact and understand record; the being of dissimilar driver license programs; unfortunate excellence road settings; and an absence of substitute transference modes like transit in the KR, Gökçekuş et al (2020)[7] were reported that injuries and deaths increased from 2016 to 2018, beside that male gender was had more chances than female in the street crash by less than two-third. Therefore, this study aimed to find out the prevalence of RTAs in a population sample of all age group in Erbil city, Iraqi Kurdistan Region, and identify the risk factors associated with highway accidents.

METHODOLOGY

The study was conducted in the capital of Iraqi Kurdistan Erbil city from the 1st, March to 15th, November 2021. Data were collected by using household visiting a community-based descriptive cross-sectional survey. A multi-stage sampling techniques used for the purpose of the study was used to collect subjects study. First, Erbil city was divided into 37 quarters based on the administrative map of the city (Table

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1), secondly, in each quarter systematic random sampling method was used to select 25 households. The first household in each quarter was selected randomly; the households that came next were selected by choosing every interval family. The study population comprised all the ages inhabitants of these families, except (less than 2 years). Collecting of data done by direct meeting using a special designed questionnaire. The questionnaire comprised sociodemographic features like age, sex, marital status, educational level, occupation type, smoking and car ownership[8-10]. Besides comprised questions on previous road accidents, alcohol consumption, environmental, location, risk factors, and outcome of road accidents

Data were analyzed using the statistical packages for social sciences (SPSS, version 24)[11,12], means were calculated to summarize numerical variables and proportions were calculated for the categorical variables, t-test was used to compare between means of some parameters during the procedure, Chi-square test was used to compare between proportions of two groups (Pattern of RTAs and demographical characteristics) of individual road users. P value of equal or less than 0.05 ($P \leq 0.05$) was considered as statistically significant[13].

In this study the Epi-info used to calculate and measured sample size supposing that the prevalence of road traffic accidents (RTAs) in Erbil is similar to the previously reported in Iraq 11.7% for victims of street (CSO,2019)[14]. It was founded that the size of the sample is 3550 was adequate to reach a 95% confidence interval for the prevalence (±2%) of this residents. The sample was increased to 3743 to house for non-response. It had been assumed that each family would have 4 persons at any age may previously suffer from street accidents then visiting 888 families will produce a sample of around 3550 or more respondents. Then, we selected 30 households in each of the 37 quarters. The Chi-square test was used for comparing rates. A P value ≤ 0.05 was used as statistically significant.

RESULTS

Our survey recognized 3743 individuals in the 888 households that had been visited. The mean ± SD age of the participants was 32.63 ± 17.84 years with statistically significant difference between the mean age of males (32.47 ± 17.89) and females (32.81 ± 17.78), P = 0.418. This study similar with (Younis,2021)[16] .A total of one-fourth 947 (25.3%) contributors were in the group age 11-20 years, whereas 656(17.5%) were in the -10 years' age group. A total of 1983(53%) contributors were male, 1760(47%) were female, total of 1430(38.2%) were single, while a total of 1380(36.9%) were married, the most educational level pattern of victims around primary 570(15.2%), intermediate 565(15.1%), and secondary 573(15.3%) schools reported, most of them reported as students by one-third 1275(34.1%), moderate economic status was 2337(62.4%), the proportion prevalence of ethnicity reported Kurdish 3303(88.2%) majority of them Muslim 3687(98.5%) (Table 2).

Table 1: Distribution of the sample size according to catchment according to the Erbil City Area

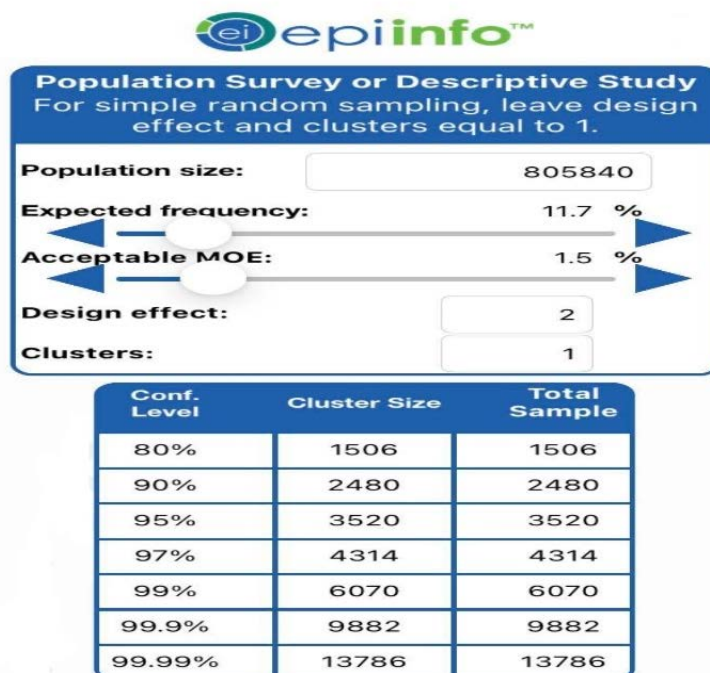| Erbil City Sectors	Residence	250/100000	Area	Area sample 25%	Required sample size	aIndividual taken/ each area
First	45576	202.3243824	11	3	200	67
Second	96276	427.3956081	22	6	421	71
Third	110964	492.5996745	26	7	485	70
Fourth	338100	1500.918766	34	9	1478	165
Fifth	97884	434.5339618	23	6	428	72
Sixth	117040	519.5727074	25	6	512	86
Total	805,537	3577	141	37	3524	3550

Figure 1: Epi info calculating sample size for the current study[15] (CDC, 2021)

Table 2: Socioeconomic distribution of study sample

Variables	Frequency	Percent	Mean
Age			
0-10	656	(17.5)	32.63
11-20	947	(25.3)	
21-30	606	(16.2)	
31-40	563	(15.0)	
41-50	458	(12.2)	
51-60	286	(7.6)	
61+	227	(6.1)	
Gender			
Male	1983	(53.0)	1.47
Female	1760	(47.0)	
Marital Status			
Single	1430	(38.2)	2.33
Married	1380	(36.9)	
Divorced	25	(0.7)	
Widow	96	(2.6)	
Child	812	(21.7)	
Educational Level			3.92
≤Preschool	345	(9.2)	
Illiterate	359	(9.6)	
Primary	570	(15.2)	
Intermediate School	565	(15.1)	
High School	573	(15.3)	
Diploma	259	(6.9)	
Bachelor	547	(14.6)	
≥Master	49	(1.3)	
Red and write	476	(12.7)	
Occupation			4.23
Housewife or Unemployed	626	(16.7	
Unskilled Manual	357	(9.5)	
Semi-skilled manual	689	(18.4)	
Skilled manual and non-manual	344	(9.2)	
Associate professional	69	(1.8)	
Skilled professional or senior managerial	35	(0.9)	
Highly skilled professional	3	(0.1)	
Child	345	(9.2)	
Student	1275	(34.1)	
Economic status			
Not Enough	549	(14.7)	2.08
Enough	2337	(62.4)	
Exceed Need	857	(22.9)	
Nationality			
Kurdish	3303	(88.2)	1.15
Arabic	375	(10.0)	
Turkmen	16	(0.4)	
Christian	20	(0.5)	
Others (Nepal, Turkish, Syrian...)	29	(0.8)	
Religion			1.02
Muslim	3687	(98.5)	
Christian	32	(0.9)	
Yazidi	24	(0.6)	
Total	3743	(100)	

Of these 3743 participants according to Table 3, with known road traffic accidents reported 675 victims, of these victims 313(46.4%) were reported as highest rate in 2019 comparison to the years 2017 and 2018. Of these 675 street accidents victims, the highest proportion prevalence of RTAs seasons were Summer 265(39.3%), at daylight 410(60.7%), in dry weather 583(86.4%), Tuesday 115(17.0) witnessed more highway crash, in July 130(19.3%), at Evening 337(49.9%).

Table 3: Environmental characteristics of road traffic accident

Variables	Features	Frequency	Percent	Mean
Years of accident	2017	175	(25.9)	2.2
	2018	187	(27.7)	
	2019	313	(46.4)	
Season	Winter	188	(27.9)	2.2
	Spring	185	(27.4)	
	Summer	265	(39.3)	
	Autumn	37	(5.5)	
Time	Day	410	(60.7)	1.3
	Night	265	(39.3)	
Weather Condition	Dry	583	(86.4)	1.28
	Rainy	46	(6.8)	
	wet	41	(6.1)	
	Cloud	5	(0.7)	
Week days	Sunday	96	(14.2)	3.95
	Monday	79	(11.7)	
	Tuesday	115	(17.0)	
	Wednesday	114	(16.9)	
	Thursday	89	(13.2)	
	Friday	106	(15.7)	
	Saturday	76	(11.3)	
Months	January	58	(8.6)	5.77
	February	51	(7.6)	
	March	60	(8.9)	
	April	79	(11.7)	
	May	40	(5.9)	
	June	89	(13.2)	
	July	130	(19.3)	
	August	66	(9.8)	
	September	30	(4.4)	
	October	21	(3.1)	
	November	24	(3.6)	
	December	27	(4.0)	
Hour category	Midnight	10	(1.5)	3.36
	Morning	74	(11.0)	
	Afternoon	254	(37.6)	
	Evening	337	(49.9)	
	Total	675	(100)	

The most municipality witnessing RTAs was number four 299(44.3%), the rate of street accident was higher in urban places 550(81.5%) of Erbil than rural one 125(18.5%), the percentage of road accidents in the streets and inside alleys, in which speed must be taken into account, is within 40 km were 203(30.1%), Private car 396(58.7%) were most vehicle involved in highway accidents, high percentage of them were new 467(69.2%), vehicle driver 475(70.4%) reported more type of road victims. The present study showed that the proportion of smoker victims were less than one fourth 164(24.3%), exceed speed involvement 74(11.0%), alcohol consumption reported among 100(14.8%), safety measurement 404(59.9%), owning driving license among 408(60.4%), the proportional prevalence of road traffic accidents reported reasons were distraction of the driver 153(22.7%)

followed by speeding 93(13.8%), the consequences of road traffic accidents due to 60(9.9%) disabilities and 15(2.2%) deaths, rather than 600(88.9%) alive with property damage or superficial hurt without necessity of hospital (Table 4.).

Table 4: Deferent factors affected road traffic accidents

Variables	Features	Frequency	Percent	Mean
Municipality	One	49	(7.3)	3.66
	Two	92	(13.6)	
	Three	97	(14.4)	
	Four	299	(44.3)	
	Five	72	(10.7)	
	Six	66	(9.8)	
Accident location	Urban	550	(81.5)	1.18
	Rural	125	(18.5)	
Street type	30 Meter	19	(2.8)	6.63
	60 Meter	47	(7.0)	
	100 Meter	77	(11.4)	
	120 Meter	11	(1.6)	
	100 Km	68	(10.1)	
	60 Km	132	(19.6)	
	40 Km	203	(30.1)	
	80 Km	96	(14.2)	
	40 Meter	11	(1.6)	
	Center	11	(1.6)	
Type of vehicle	Private Car	396	(58.7)	2.85
	Taxi	51	(7.6)	
	Truck-Lorry	6	(0.9)	
	Motor	54	(8.0)	
	Pickup	58	(8.6)	
	Bicycle	93	(13.8)	
	Van or Bus	17	(2.5)	
Vehicle made	New	467	(69.2)	1.42
	Medium	128	(19.0)	
	Old	80	(11.9)	
	Total	675	(100)	
Victims type	Driver	475	(70.4)	
	Passenger	139	(20.6%)	
	Pedestrians	61	(9.0%)	
Total		675	(100)	

According to the Figure 2. The highest proportion prevalence of effected body part in present study were lower limbs 194(28.7%), followed by head 176(26.1%) and upper limbs 169(25%), and lowest proportion prevalence reported back injury 23(3.4%), this data in our opinion depend on the environmental situation, vehicle type and risk condition of this result.
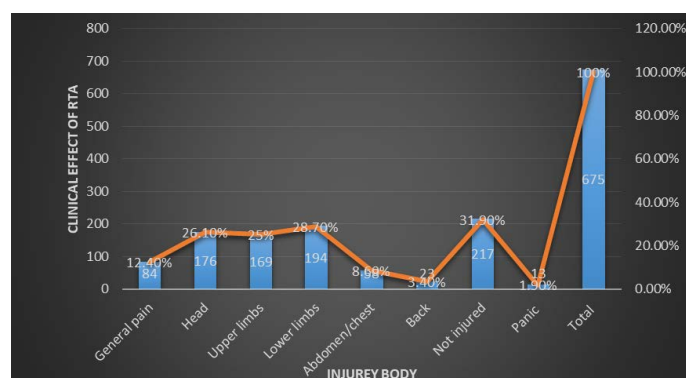

Figure2: Clinical outcome distribution of RTAs Victims

In our study among 675 victims of RTAs the smoking proportion were nearly one-fourth 164(24.3%), Alcohol consumption 74(11%), high rapidity 100(14.8%), about one-third 211(31.3%) making measurement safety, whereas only 408(60.4%) have licenses, the highest proportion of road accidents were between distraction 153(22.7%) and careless 133(19.7%) (Table 5).

Table 5: Risk factors due to road traffic accidents

	Features	Frequency	Percent	Mean
Smoking	Non-Smoker	389	(57.6)	1.9244
	Ex-Smoker	35	(5.2)	
	Current Smoker	164	(24.3)	
	Not applicable(NA)	87	(12.9)	
Alcohol drinking	Yes	74	(11.0)	2.0281
	No	508	(75.3)	
	NA	93	(13.8)	
Exceeds speed limits	Yes	100	(14.8)	1.9363
	No	518	(76.7)	
	NA	57	(8.4)	
Seatbelt/Wearing helmet	Yes	211	(31.3)	1.7763
	No	404	(59.9)	
	NA	60	(8.9)	
Owning driving license	Yes	408	(60.4)	1.6504
	No	95	(14.1)	
	NA	172	(25.5)	
Causes of RTAs*				
Speeding	Yes	93	(13.8)	0.1378
	No	582	(86.2)	
Reverse driving	Yes	74	(11.0)	0.1096
	No	601	(89.0)	
Distraction	Yes	153	(22.7)	0.2267
	No	522	(77.3)	
Unsafe vehicle	Yes	32	(4.7)	0.0474
	No	643	(95.3)	
Unsafe Road Infrastructure	Yes	19	(2.8)	0.0281
	No	656	(97.2)	
Turning	Yes	21	(3.1)	0.0311
	No	654	(96.9)	
Hit by Vehicle	Yes	58	(8.6)	0.0859
	No	617	(91.4)	
Careless	Yes	133	(19.7)	0.1970
	No	542	(80.3)	
Sudden show	Yes	23	(3.4)	0.0341
	No	652	(96.6)	
Fatigue	Yes	36	(5.3)	0.0533
	No	639	(94.7)	
Others	Yes	33	(4.9)	0.5

	No	642	(95.1)	
Outcome	Alive Without Disability	600	(88.9)	
	Alive With Disability	60	(8.9)	
	Die	15	(2.2)	
	Total	675	(100)	

*Multi response discovered among victims

A significance value (P-value) and 95% Confidence Interval (CI) of the difference is reported, the victims of road traffic accidents participants had a statistically significant higher mean age (33.956± 16.1198) than non-previous accidents of roads participants (32.3435± 18.1887), P < 0.001. There was a statistically important relationship between previous road traffic accidents and age, male respondents, marital status, educational level and occupation. Whereas statistically a non-significant relationship reported among religion family income and family income (Table 6).

Table 6: Association between Road Traffic Accidents prevalence and other variables

Variables	Features	Experiencing road accidents			
		Yes	No	Total	**P-value**
Age	0-10	76(11.6)	580(88.4)	656(100)	
	11-20	160(16.9)	787(83.1)	947(100)	0.0335
	21-30	138(22.8)	468(77.2)	606(100)	
	31-40	129(22.9)	434(77.1)	563(100)	
	41-50	89(19.4)	369(80.6)	458(100)	
	51-60	60(21)	226(79)	286(100)	
	61 +	23(10.1)	204(89.9)	227(100)	
Gender	Male	502(25.3)	1481(74.7)	1983(100)	0.0001
	Female	173(9.8)	1587(90.2)	1760(100)	
Religion	Muslim	663(18)	3024(82)	3687(100)	0.581
	Christian	8(25)	24(75)	32(100)	
	Others (Hindus …)	0(0.0)	0(0)	0(100)	
	Yazidi	4(16.7)	20(83.3)	24(100)	
Marital Status	Single	271(19)	1159(81)	1430(100)	0.0001
	Married	287(20.8)	1093(79.2)	1380(100)	
	Divorced	7(28.0)	18(72)	25(100)	
	Widow	9(9.4)	87(90.6)	96(100)	
	Child	101 (12.4)	711(87.6)	812(100)	
Nationality	Kurdish	611(18.5)	2692(81.5)	3303(100)	0.581
	Arabic	60(16.0)	315(84)	375(100)	
	Turkmen	2(12.5)	14(87.5)	16(100)	
	Christian	2(10.0)	18(90)	20(100)	
	Others(Nepal, Turkish, Syrian...)	0(0.0)	29(100)	29(100)	
Family income	Not Enough	109(19.9)	440(80.1)	549(100)	0.192
	Enough	401(17.2)	1936(82.8)	2337(100)	
	Exceed Need	165(19.3)	692(80.7)	857(100)	
Educational level	≤Preschool	33(9.6)	312(90.4)	345(100)	0.0001
	Illiterate	54(15.0)	305(85)	359(100)	
	Primary	134(23.5)	436(76.5)	570(100)	
	Intermediate School	93(16.5)	472(83.5)	565(100)	
	High School	100(17.5)	473(82.5)	573(100)	
	Diploma	52(20.1)	207(79.9)	259(100)	
	Bachelor	126(23.0)	421(77)	547(100)	
	≥Master	15(30.6)	34(69.4)	49(100)	
	Red and write	68(14.3)	408(85.7)	476(100)	
Occupation	Housewife or Unemployed	48(7.7)	578(92.3)	626(100)	0.00001
	Unskilled Manual	93(26.1)	264(73.9)	357(100)	
	Semi-skilled manual	182(26.4)	507(73.6)	689(100)	
	Skilled manual and non-manual	100(29.1)	244(70.9)	344(100)	
	Associate professional	19(27.5)	50(72.5)	69(100)	
	Skilled professional or senior managerial	7(20)	28(80)	35(100)	
	Highly skilled professional	1(33.3)	2(66.7)	3(100)	
	Child	33(9.6)	312(90.4)	345(100)	
	Student	192(15.1)	1083(84.9)	1275(100)	

DISCUSSION

Our study revealed that out of 3743 people involved in the study the prevalence proportion of road traffic accidents for the years (2017, 2018, 2019) among Erbil city populations was 675(18%). This prevalence is much upper than what was founded from a report by CSO (2019)[14] in Iraq, also the highest proportion prevalence of RTAs reported in the year of 2019, in contrast to another retrospective study between 2014-2018, reported the years of 2014 heights rate of road crash in Tanzania[17], This is due to many factors, including the social life and lifestyle of the people living in Erbil as a city and Tanzania as a country, and we must not forget that our research at this time varies according to its place. In the present study we founded the majority of road victims were at age 11-20 years, and male was greater 501(74%) than female 174(26%) this was revealed non-significantly statistical relationship with people whom experienced road accident previously, similarly in another study, by males constituted 71% and females constituted only 29% of the total victims. Furthermore, age between 20-40 years reported to be more susceptible to RTAs[18]. The present study assessed the Socioeconomic factors contributes RTAs in the city of Erbil there were a significant association between gender, marital status, educational level and the occupation of the victims, this study is founded with the standard measurement of risk factors of RTAs of WHO[2], in contradicting another study founded that except occupation there were no Regarding socio-demographic features, gender showed no significant relationship with educational position ($p = 0.201$) or marital position ($p = 0.883$) in 2018. This differentiation may come from the differentiation in human nature, education, culture and environments[19,20]. The present study assessed the factors contributes RTAs in the city of Erbil in which showed the majority of road accident involvement were Single individual and followed by Child the reasons may returned to offspring are regularly absorbed in their personal instant interests they oblivious can be to their environments and may be the want be in the attention circle, because that why we revealed careless in the victims of RTAs in the second degree nearly one-fifth of causes. For the first type of people (single) for more rate prevalence of accidents, this due to sedentary lifestyle, alcohol consumption, road rage, and may be social life and peer also effect, that why we founded a statistically significant relationship between marital status and previous RTAs, similarly, this study approved by a study in Bates et al (2014)[20], reported these factors affected human crash and more complicated human lifestyle. Present study showed the highest proportion of road traffic accidents happened due to distraction by less than one-fourth among all the causes, this sentences is similarly with a lot of study[21,22] it has been originate that young road users likely more to be strictly hurt if they are unfocussed by a smart mobile while driving. The involvement of mobile phones with driving has been found to reflect the level of cognitive and behavioral association that people have with their phones.

CONCLUSION

To our knowledge, this is one of the foremost research to detect trend level RTAs, injuries, fatalities, incidence and mortality rates in six municipalities of Erbil in whole, Erbil over a three-year period. The prevalence of road traffic accident is higher than WHO standards, this study points out the influences factor due to injury severity of RTAs and greatest at-risk road users in urban and rural, due to human error. In fact, statistically significant relationship founded between road traffic accidents and main sociodemographic feature of respondents such as age, gender, marital status, and educational level and occupation types.

REFERENCES

1. Global Health Estimates 2019: Global Health Estimates: Life expectancy and leading causes of death and disability. Geneva, World Health Organization; 2020.
2. WHO. Road traffic injuries: Key facts. 2021. Geneva.
3. WHO. World Health Statistics: monitoring health for the SDGs, sustainable development goals. 2021.
4. Jrew B, Msallam M, Khaled S, et al. Analysis and Evaluation of Traffic Accidents for Principle Urban Streets in Arbil City in Iraq. Diyala J Eng Sci 2017;10:118-31.
5. Mohammed H, Jaff D, Schrock S (2019) The challenges impeding traffic safety improvements in the Kurdistan Region of Iraq. Transportation Research Interdisciplinary Perspectives 2017;2(0):100029.
6. Leidman E, Maliniak M, Sultan AS, et al. Road traffic fatalities in selected governorates of Iraq from 2010 to 2013: prospective surveillance. Confl Health 2016; 10(2):1-10.
7. Gökçekuş H, Albkra SI, Musa MK. Characteristic of Car Crash in North of Iraq. Int J Recent Tech Eng 2020;9(1):15-21.
8. Younis NM, Ahmed MM, Hussein AA. Nurses' knowledge, attitude and practice towards preparedness of disaster management in emergency of mosul teaching hospitals. Medico-Legal Update 2020;20(3):775-79.
9. Ahmed MM, Younis NM, Hussein AA. Prevalence of tobacco use among health care workers at primary health care centers in Mosul City. Pakistan J Med Health Sci 2021;5(1):421-4.
10. Naji AB, Ahmed MM, Younis NM. Adherence the Preventive Measure Against for COVID-19among Teachers at University of Mosul. In J Med Tox Leg Med 2021;24(4):273-7.
11. Ahmed MM, Younis NM, Hussein AA. Violence towards Nurses staff at teaching hospitals in Mosul City. Indian J Forensic Med Toxicol 2020;14(3):2598-603.
12. Younis NM, Ahmed MM, Dhahir NM. Prevalence of Covoravirus among Healthcare Workers. Int J Med Toxicol Legal Med 2021;24(2):1.
13. Arkkelin, D. Using SPSS to Understand Research and Data Analysis. Psychology Curricular Materials. 2014: 1.
14. CSO. Central Statistical organization Iraq. Statistics of recorded traffic accidents for the year 2018, 2019.
15. CDC. Epi Info Downloads. Epi Info For Windows. Download version 7. 2021.
16. Muwfaq YN, Ahmed MM, Abdulsalam RR. Assessing Quality of Life in Palliative Care. Bahrain Med Bull 2021;43(3):594-6.
17. Walugembe F, Levira F, Ganesh BS, et al. A retrospective study on the epidemiology and trends of road traffic accidents, fatalities and injuries in three Municipalities of Dar es Salaam region, Tanzania between 2014-2018. Pan Afr Med J 2020;36:24.
18. Selvaraj T, Uthayakumar R. A Retrospective Study of Fatal Road Traffic Accidents on Autopsies done at Madurai Medical College and Hospital. Indian J Forensic Med Toxicol 2020;14(3):764-7.
19. Younis NM, Mahmoud M, Ahmed A, et al. University Students' Attitude Towards E-Learning. Bahrain Med Bull 2021;43(2):460-2.

20. Bates LJ, Davey J, Watson B, et al. Factors Contributing to Crashes among Young Drivers. Sultan Qaboos Univ Med J 2014;14(3):e297-e305.

21. Ahmed MM, Younis NM, Dhahir NM, et al. Acceptance of Covid-19 vaccine among nursing students of Mosul University, Iraq. Rawal Med J 2022;47:2.

22. Esses DF, Costa FW, Sá CD, et al. Occupational group, educational level, marital status and deleterious habits among individuals with maxillofacial fractures: retrospective study. Med Oral Patol Oral Cir Bucal 2018;23(1):e13-e22.