Chronic Diseases Journal

DOI: 10.22122/cdj.v6i4.327 Published by Vesnu Publications

An epidemiological survey of traffic accidents in Kangavar, Iran, in 2014

Saeede Jafari[1], Amir Jabbari[1], Nader Esmailnasab[2], Ghobad Moradi[2], Saeed Sohrabi[3]

1 Student Research Committee, Kurdistan University of Medical Sciences, Sanandaj, Iran
2 Social Determinants of Health Research Center, Research Institute for Health Development, Kurdistan University of Medical Sciences, Sanandaj, Iran
3 Health Deputy, Kermanshah University of Medical Sciences, Kermanshah, Iran

Original Article

Abstract

BACKGROUND: Traffic accidents in Iran are the second leading cause of mortality and the first cause of years of life lost (YLL). This study aims to determine the epidemiology of road traffic accidents referring to Shahid Chamran Hospital of Kangavar, Iran, in 2014.

METHODS: This was a cross-sectional descriptive-analytical study. The studied population included all dead and injured patients of traffic accidents referring to Shahid Chamran Hospital in Kangavar in 2014 that by using census sampling method were entered in the study. The data collection tool was a researcher-made checklist involving demographic and traffic variables that were filled by examining hospital records and making phone calls to all participants. Data were analyzed through chi-square and analysis of variance (ANOVA) tests.

RESULTS: The mean age of participants was 30.98 ± 17.06 years. 75.81% of the population was men. The average time of traffic accident occurrence was 15:14:47. The majority of injured subjects were motorcycle drivers (32.89%), followed by car passengers (22.41%), and pedestrians (19.64%). Car-motorcycle (29.60%), overturning (28.66%), and car-pedestrian collision (17.45%) were the first three most common types of traffic accidents, respectively. Multiple trauma (42.29%), lower limb trauma (24.88%), and head/neck trauma (17.87%) were the most frequent injuries. There was a statistically significant association between the types of accidents and the variables of marital status, educational level, place of residence, days of the week, seasons, injured person's condition, type of collision, and the injured organ ($P < 0.050$).

CONCLUSION: Based on the findings, since the majority of casualties in traffic accidents are motorcyclists, it is recommended to review the traffic rules for this group.

KEYWORDS: Epidemiology, Traffic Accidents, Iran

Date of submission: 22 Sep. 2017, ***Date of acceptance:*** 16 Dec. 2017

Citation: Jafari S, Jabbari A, Esmailnasab N, Moradi G, Sohrabi S. **An epidemiological survey of traffic accidents in Kangavar, Iran, in 2014.** Chron Dis J 2018; 6(4): 159-64.

Introduction

One of the major causes of trauma in the world is traffic accidents, which are directly associated with behavioral factors, the growing number of vehicles, and industrial developments in the 20th century.[1] Targeting an age group that are active economically, road traffic injuries impose a heavy burden on the national economy as well as on households.[2] According to the World Health Organization (WHO) global status report on road safety in 2015, the total number of road traffic deaths worldwide was 1.25 million per year, with the highest mortality rates being in low-income countries. The low-income and middle-income countries have the most traffic accidents and their mortality rate is two times that of high-income countries. They account for 90% of global road traffic deaths.[3] In the ranking of the most important causes of mortality and years of life lost (YLL) in Iran,

Corresponding Author:
Ghobad Moradi
Email: moradi_gh@yahoo.com

traffic accidents ranked second and first, respectively.[4,5] Statistics (2005) showed that the mortality rate of traffic accidents in Iran was 44 per 100000 population, and 1.06 million people were injured and disabled.[6] Research results indicate that a wide range of variables are the determinants of mortality from road traffic accidents. Being male, low age, mental distress, urbanization rate, per capita gross domestic product (GDP), increased traffic density, and motorization rates are mentioned as risk factors.[7,8]

Targeting the labor force, road traffic accidents impose high economic burdens on societies, because men and age group of < 40 years are among the most important groups at risk.[9,10] Traffic accidents, therefore, are one of the social, economic, and health problems due to their extent of impact. The reduction of these accidents is one of the priorities of planners and policymakers in every society. Kangavar City is located on the main communication routes in Iran; and therefore, deals with a heavy traffic of cars and heavy vehicles. Accordingly, it is a good case for conducting traffic studies and related risk factors. Thus, the objective of this study is to evaluate the epidemiology of road traffic accidents referring to Shahid Chamran Hospital of Kangavar in 2014.

Materials and Methods

This study was cross-sectional descriptive-analytical. The studied population included all traffic casualties referring to Shahid Chamran Hospital in Kangavar in 2014. Sampling method of this study was census. Therefore, all the people who referred to the hospital in 2014 due to traffic accidents and had medical records were studied. Data were collected using a researcher-made checklist containing demographic variables such as age, sex, marital status, educational level, age in the first driving experience for motorcycle drivers, and also traffic variables including the condition of the injured (death/injury), the type of traffic accident, the time and place of the accident, the number of car passengers, the injured organ, and the role of the injured (driver/passenger/pedestrian) in two stages. In the first stage, the data were extracted from hospital records. In the second stage, the studied variables in the checklist that were not recorded in the medical files were completed. At this stage, calls were made to people. At the end, data were analyzed by STATA software (version 12) using descriptive (mean and frequency) and inferential [chi-square test and analysis of variance (ANOVA)] statistics. The significance level was considered to be 0.05.

Results

Among the accidents registered at the hospital, 864 cases were eligible for inclusion in the study. 75.81% of the participants were men and 24.19% were women. The mean age of the subjects was 30.98 ± 17.06 years. 58.6% of the subjects were married and 41.4% were single. The results of demographic variables are presented in table 1.

A total of 864 referrals to the hospital were made following 670 accidents, of which 57.52% were intracity, 40.72% were intercity, and 6.71% were intravillage accidents. 858 cases were injured and 6 ones died. In terms of time (season, month, and day), summer (35.37%), June (14.33%), and Thursday (17.82%) had the highest number of accidents. The average time of traffic accident occurrence was 15:14:47. The majority of subjects were motorcycle drivers (32.89%) who had started driving at the age of 17.27 ± 5.87 on average. Car-motorcycle collision (29.60%) was the most common type of accidents. The average number of car passengers was 2.05 ± 1.28, which were family members or relatives in 77.84% of the cases. In examining the most common injuries to the subjects, multiple trauma (42.29%) had the highest frequency. The results of traffic variables are presented in table 1.

Table 1. Demographic and traffic variables of the study participants

Variables	Intracity	Intercity	Intravillage	Total	P
Age (year) (mean ± SD)	30.00 ± 18.19	32.01 ± 15.74	31.37 ± 18.09	30.98 ± 17.06	0.260
Age in the first motorcycle riding experience (mean ± SD)	17.05 ± 5.98	17.52 ± 5.84	18.10 ± 5.70	17.27 ± 5.87	0.690
Hour (mean)	15:27:43	14:42:24	16:29:11	15:14:47	
Sex [n (%)]					
Male	298 (79.47)	289 (72.07)	40 (72.73)	655 (75.81)	0.050
Female	77 (20.53)	112 (27.93)	15 (27.27)	209 (24.19)	
Marital status [n (%)]					
Single	175 (46.79)	148 (37.09)	18 (32.73)	356 (41.40)	0.010
Married	199 (53.21)	251 (62.91)	37 (67.27)	504 (58.60)	
Educational level [n (%)]					
Illiterate	45 (27.38)	19 (9.36)	1 (3.70)	66 (12.45)	0.020
Primary school-junior high school	121 (41.44)	75 (36.95)	16 (59.26)	214 (40.38)	
High school-diploma	92 (31.51)	71 (34.98)	7 (25.93)	174 (32.83)	
Associate-bachelor degree	34 (11.64)	34 (16.75)	3 (11.11)	72 (13.58)	
Master degree and higher	0 (0)	4 (1.97)	0 (0)	4 (0.75)	
Place of residence [n (%)]					
Village	59 (15.73)	123 (30.67)	44 (80.00)	236 (27.38)	< 0.001
City	316 (84.27)	278 (69.33)	11 (20.00)	626 (72.62)	
Day [n (%)]					
Saturday	58 (17.37)	38 (14.84)	6 (13.95)	106 (16.01)	0.010
Sunday	49 (14.67)	26 (10.16)	2 (4.65)	80 (12.08)	
Monday	47 (14.07)	28 (10.94)	7 (16.28)	87 (13.14)	
Tuesday	45 (13.47)	34 (13.28)	8 (18.60)	89 (13.44)	
Wednesday	48 (14.37)	32 (12.50)	2 (4.65)	87 (13.14)	
Thursday	56 (16.77)	50 (19.53)	6 (13.95)	118 (17.82)	
Friday	31 (9.28)	48 (18.75)	12 (27.91)	95 (14.35)	
Month [n (%)]					
April	21 (6.23)	22 (8.43)	2 (4.65)	46 (6.87)	0.300
May	24 (7.12)	20 (7.66)	4 (9.30)	49 (7.31)	
June	37 (10.98)	40 (15.33)	11 (25.58)	96 (14.33)	
July	44 (13.06)	20 (7.66)	4 (9.30)	69 (10.30)	
August	46 (13.65)	29 (11.11)	5 (11.63)	81 (12.09)	
September	49 (14.54)	32 (12.26)	5 (11.63)	87 (12.99)	
October	25 (7.42)	37 (14.18)	2 (4.65)	72 (10.75)	
November	13 (3.86)	10 (3.83)	2 (4.65)	26 (3.88)	
December	13 (3.86)	11 (4.21)	1 (2.33)	28 (4.18)	
January	27 (8.01)	14 (5.36)	2 (4.65)	43 (6.42)	
February	18 (5.34)	12 (4.60)	3 (6.98)	33 (4.93)	
March	20 (5.93)	14 (5.36)	2 (4.65)	40 (5.97)	
Season [n (%)]					
Spring	82 (24.33)	82 (31.42)	17 (39.53)	191 (28.51)	0.010
Summer	139 (41.25)	81 (31.03)	14 (32.56)	237 (35.37)	
Autumn	51 (15.13)	58 (22.22)	5 (11.63)	126 (18.81)	
Winter	65 (19.29)	40 (15.33)	7 (16.28)	116 (17.31)	
Status of the injured subject [n (%)]					
Vehicle driver	10 (2.69)	82 (20.81)	3 (5.77)	96 (11.57)	< 0.001
Motorcycle rider	151 (40.59)	95 (24.11)	20 (38.46)	273 (32.89)	
Bicycle rider	7 (1.88)	3 (0.76)	0 (0)	10 (1.20)	
Pedestrian	138 (37.10)	21 (5.33)	4 (7.69)	163 (19.64)	
Vehicle passenger	19 (5.11)	163 (41.37)	4 (7.69)	186 (22.41)	
Motorcycle passenger	39 (10.48)	30 (7.61)	17 (32.69)	90 (10.84)	
Other	8 (2.15)	0 (0)	4 (7.69)	12 (1.45)	

Table 1. Demographic and traffic variables of the study participants (continue)

Variables	Intracity	Intercity	Intravillage	Total	P
Type of accident [n (%)]					
Car-car	13 (3.89)	32 (12.45)	1 (2.44)	47 (7.32)	< 0.001
Car-motorcycle	116 (34.73)	58 (22.57)	13 (31.71)	190 (29.60)	
Car-pedestrian	94 (28.14)	13 (5.06)	5 (12.20)	112 (17.45)	
Car-bicycle	5 (1.50)	2 (0.78)	0 (0)	7 (1.09)	
Motorcycle-motorcycle	20 (5.99)	3 (1.17)	0 (0)	23 (3.58)	
Motorcycle-pedestrian	39 (11.68)	9 (3.50)	0 (0)	49 (7.63)	
Motorcycle-bicycle	2 (0.60)	0 (0)	0 (0)	2 (0.31)	
Overturning	35 (10.48)	127 (49.42)	17 (41.46)	184 (28.66)	
Other	10 (2.99)	13 (5.06)	5 (12.20)	28 (4.36)	
Injured organ [n (%)]					
Head and neck	61 (16.35)	82 (20.60)	4 (7.41)	153 (17.87)	< 0.001
Upper limb	41 (10.99)	54 (13.57)	3 (5.56)	101 (11.80)	
Lower limb	127 (34.05)	67 (16.83)	10 (18.52)	213 (24.88)	
Chest	8 (2.14)	18 (4.52)	1 (1.85)	27 (3.15)	
Multiple places	136 (36.46)	177 (44.47)	36 (66.67)	362 (42.29)	

The results of univariate analysis indicated that there was a significant association between the type of accident (in terms of intracity, intercity, and intravillage locations) and marital status, educational level, place of residence, days of the week, seasons, injured subject's status, type of incident, and damaged organ (P < 0.050) (Table 1).

The most frequent accidents were related to residents (according to the classification of the health network in the city) in the areas covered by Center 2, Base 1, and Center 1 with 16.44%, 16.30% and 14.52%, respectively. The highest number of intracity accidents occurred at Enghelab Boulevard (11.82%), Iraqi Square (8.31%), and Azadegan Square (4.21%). The highest number of intercity accidents occurred at Nahavand junction (6.18%), Tuyserkan junction (5.79%), and Karkhane junction (5.41%). And the highest number of intravillage accidents occurred in Gowdin (11.63%), and Dehlor and Qarloq villages (6.98%).

Discussion

In this study, out of 670 traffic accidents, 52.57% were intracity, 40.72% were intercity, and 71.70% were intravillage. The average age of traffic casualties in this study was similar to that of other studies in Iran.[11,12] The male/female ratio of traffic accidents was 13/3. Time surveys showed that most intracity accidents occurred on Saturday (17.37%), most intercity accidents occurred on Thursday (19.53%), and most intravillage accidents occurred on Friday (27.91%), and the difference was statistically significant (P < 0.010). Increased tendency of people for excursion and recreation on weekends and going back to work at the beginning of the week (Saturday) have increased crowdedness, resulting in an increase in accidents on these days. No significant difference was observed between the number of accidents and the month of the accident. In general, however, most accidents occurred in June (14.33%) and September (12.99%). The reason for this is clear. The beginning and the end of trips are in June and September. These results are partly consistent with those obtained by Khorshidi et al., which showed that most accidents occurred on Thursdays and in summer.[13] The results of this study showed that the most important groups at high risk of traffic accidents are motorcycle riders (40.59%), followed by pedestrians (37.10%) in the cities; car passengers (41.37%) and motorcycle riders (24.11%) between the cities; and motorcycle riders (38.46%) and motorcycle passengers (32.69%) in villages.

Motorcycle riders and car passengers made the highest casualties in intracity and intercity traffic accidents. This result is consistent with that of Sadeghian et al.[14] Most intracity accidents were car-motorcycle collisions (34.73%), while most intercity (49.42%) and intravillage accidents (41.46%) were mostly due to overturning. One of the main reasons for car-motorcycle accidents and motorcycle casualties in this city can be due to the frequent use of motorcycle as an easy vehicle to avoid traffic congestion. Motorcycles, however, lack safety equipment and most motorcycle passengers do not observe safety measures; and thus, they are most likely to be injured in case of accidents. The results related to the age of first motorcycle riding experience show that motorcycle riders practice riding before obtaining a license. In this study, the minimum age of the first motorcycle riding experience was 5 years and the maximum age was 53 years (mean: 17.27 ± 5.87). The findings showed that the most important organs damaged in traffic accidents were multiple injuries and lower limb injury in intracity and intravillage accidents, while they were multiple injuries and neck and head injury in intercity accidents. This can be well justified by the type of accidents and at risk groups.

One of the limitations of this research is that it does not address the status of addiction and personal and psychological disorders of the casualties, especially those of car drivers and motorcycle riders. It is suggested to conduct similar studies to examine the above variables.

Conclusion

According to the results of this study, motorcycles play an important role in accidents and injuries, and, more importantly, the average age of starting to ride motorcycles is lower than the age allowed for obtaining a license. It is essential to design appropriate interventions to educate the correct culture of motorcycle use and to implement these interventions in middle and high schools. In addition, it is recommended to develop training and intervention programs tailored to the time and place of the accidents by the traffic police and health centers. It is also recommended to develop and strengthen safe community committees in the city.

Conflict of Interests

Authors have no conflict of interests.

Acknowledgments

The researchers appreciate the sincere help of the collaborating staff of Shahid Chamran Hospital and the health network of Kangavar City. The present study was conducted with the financial support of the Research and Technology Department of Kurdistan University of Medical Science with the registration number 95.64.

References

1. Bastos YG, Andrade SM, Soares DA. Characteristics of traffic accidents and victims treated through a pre-hospital service in a city in southern Brazil, 1997/2000. Cad Saude Publica 2005; 21(3): 815-22.
2. Prinja S, Jagnoor J, Chauhan AS, Aggarwal S, Ivers R. Estimation of the economic burden of injury in north India: A prospective cohort study. Lancet 2015; 385(Suppl 2): S57.
3. World Health Organization. Global status report on road safety 2015. Geneva, Switzerland: World Health Organization; 2015.
4. Montazeri A. Road-traffic-related mortality in Iran: A descriptive study. Public Health 2004; 118(2): 110-3.
5. Saadat S, Yousefifard M, Asady H, Moghadas Jafari A, Fayaz M, Hosseini M. The most important causes of death in Iranian population; A retrospective cohort study. Emerg (Tehran) 2015; 3(1): 16-21.
6. Bhalla K, Naghavi M, Shahraz S, Bartels D, Murray CJ. Building national estimates of the burden of road traffic injuries in developing countries from all available data sources: Iran. Inj Prev 2009; 15(3): 150-6.
7. Rodrigo A, Perera D, Eranga VP, Peris MU, Pathmeswaran A. Road rage in Sri Lanka: Prevalence and psychiatric distress. Ceylon Med J 2015; 60(3): 86-90.
8. Rezaei S, Bagheri Lankarani K, Karami Matin B, Bazyar M, Hamzeh B, Najafi F. Determinant of road

traffic crash fatalities in Iran: A longitudinal econometric analysis. J Res Health Sci 2015; 15(3): 163-7.
9. Kanchan T, Kulkarni V, Bakkannavar SM, Kumar N, Unnikrishnan B. Analysis of fatal road traffic accidents in a coastal township of South India. J Forensic Leg Med 2012; 19(8): 448-51.
10. Mirzaei M, Mirzadeh M, Shogaei FH, Mirzaei M. Trends in road traffic deaths in Yazd, Iran, 2. Arch Trauma Res 2016; 5(2): e29266.
11. Roudsari BS, Sharzei K, Zargar M. Sex and age distribution in transport-related injuries in Tehran. Accid Anal Prev 2004; 36(3): 391-8.
12. Karbakhsh M, Rostami Gouran N, Zargar M. Factors influencing the severity of injuries in motor vehicle crashes. Payesh Health Monit 2004; 3(4): 273-8. [In Persian].
13. Khorshidi A, Ainy E, Hashemi Nazari SS, Soori H. Temporal patterns of road traffic injuries in Iran. Arch Trauma Res 2016; 5(2): e27894.
14. Sadeghian F, Khosravi A, Emamian MH, Younesian R. The pattern of road traffic injuries and related factors in Shahrood, Iran. Payesh Health Monit 2008; 7(3): 225-33. [In Persian].