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ORIGINAL ARTICLE

Demographic characteristics of people injured in driving accidents and admitted to Imam Khomeini hospital in Urmia, Iran, in 2016

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Abstract

Introduction: Nowadays, one of the most important risks threatening the health promotion and development of the community is increasing the number of driving accidents. The present study aimed to evaluate the demographic characteristics of the individuals injured in driving accidents and admitted to Imam Khomeini Hospital of Urmia, Iran, in 2016.

Methods: This cross-sectional retrospective study was conducted on all road accident patients hospitalized in Imam Khomeini Hospital of Urmia using the census method in 2016. A total of 2050 medical records were reviewed, and 2015 of them were included in the study. The data were collected using a checklist by which the demographic and accidental data of the injured people were recorded. Then, the data were entered into SPSS software (version 16) and described by frequency distribution tables, central indices, and dispersion (e.g., as frequency and calculating the mean of findings). Logistic regression was also used to investigate the factors affecting the survival of the injured subjects.

Results: Mean age of the subjects was reported as 33.63±18.53 years. Most of the injured people were male (73.2%) and self-employed (46.8%). Majority of the female subjects were housewives (70.8%). In two gender groups, most accidents occurred on the streets and within the city. Moreover, 48.1% of the injured subjects were male, and 48.1% of the females were transferred to the hospital by emergency department. Moreover, 56 (0.20%) injured cases died before discharge from the hospital.

Conclusions: Most accidents occurred on the streets and within the city among males, as well as low-educated and self-employed people. Therefore, this group should be considered a priority in designing and implementing a variety of educational interventions.

Key words: Accidents, Demographic factors, Injuries

Introduction

Injury is a major health risk in the world and the most common cause of mortality in the age group of 1-42 years. The mortality rate caused by injury in children and adolescents is higher than

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that of cardiovascular and cancer diseases (1). The injuries caused by traffic accidents are predictable and preventable events that impose high costs on developing countries (2, 3). Based on the World Health Organization (WHO), 1.2 million people annually die due to road accidents, and 30.3% of the illnesses and disabilities, as well as 28.7% of mortalities, are due to road accidents (4). Without increasing effective measures, the total number of injuries and mortalities caused by road accidents will increase by 60% to 80% during 2000 and 2020 (5).

In the United Arab Emirates, the mortality rates caused by motorcycles were higher than those in industrialized countries. In Saudi Arabia, at least one person dies due to traffic accidents, and four people are injured. In Kuwait, traffic accidents are one of the three main causes of mortality. Traffic accidents leading to death in Iran are 34.1 per 100,000 people, which is much higher than the global average (i.e., 18 per 100,000 individuals). Traffic accidents are the second cause of mortality, leading cause of losing years of life due to early death, and most common cause of injury (6-10).

Since most victims of driving accidents are young people, the damage and injuries caused by road accidents impose many economic burdens on the communities. Therefore, planning and taking appropriate measures are recommended to prevent road accidents among the various groups of the community, especially young people (11, 12). In addition, road accidents lead to injuries among an active group of individuals, as well as the increased rates of losing life and irreparable consequences, such as mental problems, huge treatment costs, burial costs, as well as criminal and judicial problems (4, 13).

The main reasons for the increase in traffic accidents in developing countries, including Iran, are the inappropriate status of traffic control, presence of worn and nonstandard vehicles, inappropriate driving culture, inadequate safety of roads, street, and vehicles, increased number of vehicles, and high number of injuries per an accident (14, 15). In addition, drug abuse and drug addiction are involved in road accidents not only in Iran but also in all countries (16).

To moderate and control the above-mentioned factors and promote appropriate practices and good culture, including the culture development of using helmets and safety belts, no eating and drinking while driving, and driving with a safe speed, adequate information is required regarding the road accident-related events. Therefore, the WHO has invited all the public and nonpublic sectors to cooperate in this regard (3). In a study conducted by Rabies et al., most of the injuries caused by road accidents were male and motorcycle riders (17). In another study conducted by Gholamali et al., most injured people were male within the age range of 0-24 years, and more accidents occurred within the city (18).

Given the negative effect of the injuries caused by accidents on the number of years of losing life, gaining knowledge of the associated variables can be valuable for health policy-makers. One of the significant characteristics of the present study was the investigation of all traffic accident victims during a year using the census method in Imam Khomeini Hospital of Urmia in West Azerbaijan, Iran, as a trauma center in this province. Therefore, it is important to pay attention to the number of victims in this center and characteristics of the victims of these accidents. Accordingly, the present study was conducted to evaluate the demographic characteristics of the subjects injured in these accidents and admitted to Imam Khomeini Hospital in 2016.

Methods

This cross-sectional retrospective study was conducted on all people injured in road accidents and admitted to Imam Khomeini Hospital of Urmia using the census method in 2016. Moreover, incomplete or illegible medical records were excluded from the study. A total of 2050 records were finally included in the study. Imam Khomeini Medical and Teaching Center is the only trauma center in Urmia University of Medical Sciences that covers the trauma patients of the provincial capital, as well as the subjects transferred to this center from other cities of West Azerbaijan.

Using a checklist, the patients' data, including age, gender, occupational status, educational level, marital status, place of residence, way of transferring the patient to the center, dispatch place, patient status when discharged from hospital, operating room, intensive care unit (ICU), head injury, length of hospital stay, hospitalization season, accident time, accident place, type of accident road, subject's position, and guilty individuals, were collected from the medical records of the patients.

Then, the data were entered into SPSS software (version 16) and described by frequency distribution tables, central indices, and dispersion (e.g., as frequency and calculating the mean of findings). Logistic regression was also used to investigate the factors affecting the survival of the injured cases. Afterward, the data of the injured subjects were confidentially

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published without mentioning their names. The thesis was also approved under the ethics code of IR.UMSU.REC.1396.373 in Urmia University of Medical Sciences.

Results

A total of 2015 injured people were included in the present study. Mean age of the injured subjects was reported as 33.63±18.53 years. Majority (73.2%) of the injured people were male in the present study. In both gender groups, most of the injured cases were within the age range of 15-54 years. Regarding the educational level, the majority (n=733, 49.7%) of the male injured people were below diploma, and most (n=214, 39.6%) of the female injured people were illiterate.

In terms of marital status, most of the male (n=882, 59.8%) and female (n=396, 73.2%) injured subjects were married. Regarding the occupational status, most of the male (n=690, 46.8%) and female (n=383, 70.8%) injured people were self-employed and housewives, respectively. Finally, regarding the place of residence, the majority of the male (n=1015, 68.9%) and female (n=381, 70.4%) injured subjects were living in urban areas (Table 1). The mortality rate in the study population was also 35 individuals per 1000 people, and 276 (16.04%) injured cases were completely disabled to work. According to the results of the present study, there was a significant relationship between occupation, education, age, marital status, with gender but no relationship with the place of residence.

Based on the results of this study, the maximum length of hospital stay was 1-5 days in 1033 (70.1%) males and 407 (75.2%) females, respectively. Regarding the season of hospitalization, most males (n=466, 31.6%) and females (n=149, 27.6%) were hospitalized in the summer and winter, respectively. In terms of the person's status during the discharge from the hospital, most males (n=429, 96.9%) and females (n=530, 98%) were discharged from the hospital while they were not recovered. Considering head injury, the majority of male (n=935, 63.4%) and female (n=333, 61.6%) injured subjects were affected during the accident.

Moreover, based on the results of the present study, 61.1% of the male and 46.2% of female injured people, as well as 17.4% of the male and 13.3% of female injured subjects, were transferred to the operating room and ICU, respectively. In this regard, there was no relationship between gender with head injury, length of hospitalization, and ICU hospitalization but a relationship with the season and operating room (Table 2).

Table 1: Demographic characteristics of studied injured people

Variable		Men	Women	Total
		n (%)	n (%)	n (%)
Occupation	Unemployed	32 (2.2)	3 (0.6)	35 (1.7)
	Farmer	52 (3.5)	0 (0)	52 (2.6)
	Housewife	25 (1.7)	383 (70.8)	408 (20.2)
	Self-Employed	690 (46.8)	14 (2.6)	704 (34.9)
	Retired	43 (2.9)	1 (0.2)	44 (2.2)
	University student	31 (2.1)	12 (2.2)	43 (2.1)
	Employee	55 (3.7)	12 (2.2)	67 (3.3)
	Others	326 (22.1)	13 (2.4)	339 (16.8)
	School student	152 (9.6)	58 (10.7)	210 (10.4)
	Child	68 (5.4)	44 (8.3)	112 (5.8)
Educational level	Illiterate	250 (17)	214 (39.6)	464 (23)
	Under diploma	733 (49.7)	203 (37.5)	936 (46.5)
	Diploma	356 (24.2)	76 (14)	432 (21.4)
	Associate's degree	38 (2.6)	8 (1.5)	46 (2.3)
	Bachelor's degree	80 (5.4)	35 (6.5)	115 (5.7)
	Master's degree	17 (1.1)	5 (0.9)	22 (1.1)
Age	0-14	172 (11.7)	98 (18.1)	270 (13.4)
	15-54	1093 (74.1)	344 (63.6)	1437 (71.3)
	55<	209 (14.2)	99 (18.3)	308 (15.3)
Marital status	Single	592 (40.2)	145 (26.8)	737 (36.6)
	Married	882 (59.8)	396 (73.2)	1278 (63.4)
Place of residence	Rural areas	459 (31.1)	160 (29.6)	619 (30.7)
	Urban area	1015 (2.2)	381 (70.4)	1396 (69.3)

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Table 2: Therapeutic characteristics of studied injured people

Variable		Men	Women	Total
		n (%)	n (%)	n (%)
Length of hospital stay	1-5	1033 (70.1)	407 (75.2)	1440 (71.5)
	6-10	299 (19.3)	89 (16.5)	388 (19.3)
	11-15	79 (5.4)	28 (5.2)	107 (5.3)
	16-20	21 (1.4)	8 (1.5)	29 (1.4)
	20<	42 (2.4)	9 (1.6)	51 (2.5)
Season	Spring	361 (24.5)	118 (21.8)	479 (23.8)
	Summer	466 (31.6)	145 (26.8)	611 (30.3)
	Autumn	380 (25.8)	129 (23.8)	509 (25.3)
	Winter	267 (18.1)	149 (27.6)	416 (20.6)
Person status during discharge from hospital	Recovery	1429 (96.9)	530 (98)	1959 (97.2)
	Death	45 (3.1)	11 (2)	56 (2.8)
Operating room	Yes	901 (61.1)	250 (46.2)	1151 (57.1)
	No	573 (38.9)	291 (53.8)	864 (42.9)
Intensive care unit	Yes	257 (17.4)	72 (13.3)	329 (16.3)
	No	1217 (82.6)	467 (86.9)	1684 (83.7)
Head injury	Yes	935 (63.4)	333 (61.6)	1268 (62.9)
	No	539 (36.6)	208 (38.4)	747 (37.1)

Table 3: Accident variables in studied injured people

Variable		Men	Women	Total
		n (%)	n (%)	n (%)
Person status	Pedestrian	435 (29.5)	157 (29)	592 (29.4)
	Cyclist	38 (2.7)	2 (0.4)	40 (2)
	Motorcyclist	245 (16.6)	9 (1.7)	254 (12.7)
	Passenger	362 (24.6)	341 (63)	703 (34.9)
	Driver	392 (26.6)	31 (5.9)	423 (21)
Time of accident	0-6	146 (9.9)	46 (8.5)	192 (9.5)
	6-12	298 (20.2)	102 (18.9)	400 (19.9)
	12-18	501 (34)	210 (38.8)	711 (35.3)
	18-24	529 (35.9)	183 (33.8)	712 (35.3)
Road type of accident	Highway	16 (1.1)	4 (0.7)	20 (1)
	Freeway	346 (23.5)	164 (30.3)	510 (25.5)
	Street	1089 (74)	358 (66.6)	35 (1.7)
	Alley	22 (1.4)	13 (2.4)	1447 (71.8)
Accident site	Within the city	661 (44.8)	219 (40.5)	880 (43.7)
	Intercity	566 (38.4)	244 (45.1)	810 (40.3)
	Village	247 (16.8)	76 (14.4)	323 (16)
Guilty subject	Driver	1436 (97.4)	527 (97.9)	1963 (97.8)
	Vehicle	14 (1.2)	1 (0.3)	15 (0.7)
	Road	20 (1.4)	10 (1.8)	30 (1.5)

On the other hand, a significant relationship was observed between the status of injury or mortality with the variables of injury severity, length of hospital stay, hospitalization in special units, surgery, head trauma, and penetrating trauma (P<0.001).

In this study, it was observed that most males (n=435, 29.5%) and females (n=341, 63%) were pedestrians and passengers, respectively. Most of the accidents occurred during the hours 18-24 and 12-18 in males (n=529, 35.9%) and females (n=2010, 38.8%), respectively. Most of the accidents in both gender groups occurred in the streets (n=1089, 74%, and n=358, 66.6%, in males and females, respectively). Most accidents (n=661, 44.8%) occurred within the city in males; however, the majority (n=244, 45.1%) of accidents in females were reported as intercity accidents.

The guilty individuals in both genders group were drivers (Table 3). Moreover, there was a

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Table 4: Delivery and dispatch of studied injured people

Variable		Men	Women	Total
		n (%)	n (%)	n (%)
Delivery and dispatch	115	709 (48.1)	260 (48.1)	969 (48.3)
	Miandoab	26 (1.8)	11 (2)	37 (1.8)
	Personal	467 (31.7)	168 (31.1)	635 (32.9)
	Khoy	12 (0.8)	5 (0.9)	17 (0.8)
	Takab	9 (0.6)	2 (0.4)	11 (0.5)
	Bukan	12 (0.8)	4 (0.7)	16 (0.8)
	Chaypareh	12 (0.8)	5 (0.9)	17 (0.8)
	Poldasht	4 (0.3)	2 (0.4)	6 (0.3)
	Naqadeh	25 (1.7)	9 (1.6)	34 (1.7)
	Mahabad	25 (1.7)	5 (0.9)	30 (1.5)
	Maku	10 (0.7)	2 (0.4)	12 (0.6)
	Piranshahr	34 (2.3)	9 (1.7)	43 (2.1)
	Transferred from other Urmia hospitals	28 (1.9)	13 (2.4)	41 (2)
	Chaldoran	1 (0.1)	0 (0)	1 (0.0)
	Oshnavieh	36 (2.4)	14 (2.6)	50 (2.5)
	Salmas	17 (1.2)	17 (3.1)	34 (1.7)
	Shahin Dej	7 (0.5)	2 (0.4)	9 (0.4)
	Showt	2 (0.1)	0 (0)	2 (0.1)
	Red Crescent	28 (1.9)	12 (2.2)	40 (2)
	Sardasht	9 (0.6)	1 (0.2)	10 (0.5)

significant relationship between gender with the position of the person and time of the accident but no relationship with the accident factor, location of the accident, and the road of the accident. The most commonly used vehicles were light vehicles, and the most frequently affected organs were the head in dead people, as well as the upper and lower limbs, including the pelvis and legs, in recovered people.

Based on the results of the present study, the majority of the injured people in both gender groups were transferred to Imam Khomeini Hospital of Urmia by ambulance (i.e., 48.1% and 48.1% of the males and females, respectively) and personal vehicle (i.e., 31.7% and 31.1% of the males and females, respectively). In this regard, there was no significant relationship between gender and means of transmission (Table 4).

Discussion

Based on the results of this study, the ratio of male and female injured people caused by accidents was about 4 to 1. It seems that this result is due to the cultural conditions governing the community and driving restrictions imposed on females. In a study conducted by Akbari et al. in 2012, it was also stated that the rate of injuries caused by accidents is higher in males than that in females due to the high risk-taking behavior of males (19). Mean age of the injured subjects was 33.63±18.53 years, and most of the injured people were within the age range of 15-54 years. The aforementioned results suggested that the younger group of people is at a higher risk of injuries caused by driving accidents, compared to other age groups.

The abovementioned finding was also confirmed by the results of studies conducted by Hafashjani et al. (20), Abbasi et al. (21), and Parvin et al. (22). In fact, these results suggested a higher risk-taking behavior among young people in the communities; therefore, designing and implementing various interventions, such as health education and health promotion interventions, are recommended to improve the attitude and performance of this group of people in driving laws and regulations, thereby reducing and preventing driving accidents.

In terms of occupational status, most males and females were self-employed and housewives, respectively, which is consistent with the results of a study conducted by Parvin et al. (22). Based on the findings of the aforementioned study, most injured people had lower levels of education. In fact, more people who were injured by accidents had a low level of education, self-employed occupational status, and inappropriate marital status. Therefore, it could be concluded that the above-mentioned factors are associated with an increased risk of accidents (22).

In the present study, 46.5% of the injured and hospitalized subjects were reported below diploma. In this regard, the findings of this study are not supported by the results of studies conducted by Rodríguez et al. in Colombia in 2012, in which the highest number of injured people is

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related to high school students. It could be due to the lack of access to illiterate and educated individuals, as there are no accurate statistics on the number of educated people separately by gender in the communities (23).

Based on the results of this study, most accidents in both male and female groups occurred in the urban areas. In a study conducted by Ali Kamal et al. in Turkey (24), most accidents happened in urban areas, which is consistent with the results of the present study. As a result, it can be concluded that the risk of road accidents in urban areas is higher than that in rural areas, which is due to a large number of motor vehicles in urban areas, compared to that in rural areas. In the present study, most of the injured people in both male and female groups suffered from head injury during the accident. Moreover, 94.2% of the subjects who died had a head injury. In a study conducted by Nazari et al. in Amol, Iran (25), the head injury was the main cause of mortality caused by driving accidents.

In a study carried out by Khorrami et al. in Fars, Iran (26), the results also showed that the risk of mortality caused by road accidents in those who had a head injury during the accident was much higher than that in subjects with no head injury. Consequently, it can be concluded that suffering from a head injury during driving accidents is a crucial factor in the survival and recovery of patients with driving accidents. This result indicates the necessity of designing and implementing a variety of interventions, including educational interventions, to improve the attitudes and performance of derivers in observing driving safety tips, such as closing seatbelt and using helmets while driving.

In the present study, most of the injured people were hospitalized for 1-5 days. In a study performed by Norouzi et al. (27), most injured patients were hospitalized for 9 days on average. Therefore, it can be concluded that driving accidents are one of the common causes of admission and hospitalization of individuals in hospitals, imposing huge costs on the health system of countries. As a result, the prevention of road accidents and even reduction of the severity of injuries caused by driving accidents by observing safety tips during driving will cause several items. The aforementioned items include improve the services provided by hospitals to other patients, reduce the investment pressure, establish therapeutic centers, cut the prices, and decrease the depreciation of hospital resources by reducing the rate of hospital beds occupied by driving accident patients.

In the present study, most accidents (n=591, 29.3%) occurred in summer; however, in a study carried out by Ali Kamal et al. (24) in Turkey in 2014, most accidents occurred in winter. In the present study, most of the accident injuries led to mortalities were observed in the subjects older than 54 years of age, males, and people with physiological risk factors (i.e., bleeding, ICU, acidosis, and surgery). The aforementioned results are consistent with the findings of studies conducted by Saidi et al. in Kenya (28), Akbari et al. in Ardabil, Iran (19), Murlidhar et al. in India (29), and Oppo et al. in the Netherlands (30).

In this study, it was observed that most injured subjects among males were pedestrians, drivers, and passengers, as well as passengers, pedestrians, and drivers, in females, respectively. In a study performed by Saidi et al. (28) in Kenya in 2012, most of the injured people were pedestrians, drivers, and motorcyclists, respectively. In fact, these groups are considered to be at high risk of accidents. In a study carried out by Akbari et al. (19), the main cause of trauma was car and motorcycle accidents. It can be stated that accidents play a major role in trauma. Moreover, 43.6% of the accidents occurred in urban areas, which is in line with the results of other studies (31).

In a study conducted by Nazari et al. (25), most accidents (n=476, 34.2%) occurred in intercity areas. In the present study, most accidents happened in the streets and within the cities. In addition, in this study, most of the injured people were transferred to the hospital by the emergency department, followed by other equipment. As the possibility of patient injury is high in transferring through other equipment, education and culture development are necessary for the safer and proper transfer of the patient to reduce the rate of injuries and mortalities, since a large number of injured people die before reaching to hospital due to the lack of access to appropriate therapeutic equipment. As a result, the development of appropriate culture in using 115 as an emergency is mandatory (32).

Moreover, it is necessary to observe safe speed to reduce the number of accidents, injuries, and mortalities. One of the limitations of this study was the incomplete and illegible nature of some of the medical records, which were excluded from the study. It is also suggested to predict the extent and severity of injuries, prognosis of accidental hospitalization, and mortality in future studies. In addition, it is recommended to record the history of addiction, drug abuse, and psychotropic injuries in hospitalized patients who had an accident.

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Conclusions

Results of this study showed that the highest rate of accidents was observed in males, married people, subjects within the age range of 15-54 years, individuals with below diploma level of education, cases with a self-employed occupation, pedestrians, as well as in urban areas and streets. Therefore, they are considered the important risk factors of accidents that can be prevented by enhancing the knowledge of the scientific community regarding the epidemiology of driving accidents. Clinical applications of the present study are the enhancement of the knowledge of treatment staff about the groups who are at higher risk of injury to equip themselves with necessary devices and equipment for the management of the injured people properly.

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Conflict of Interest

The authors declare that there is no conflict of interest.

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