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Epidemiology of Urban Traffic Accidents: A Study on the Victims' Health Records in Iran

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Abstract

Introduction: Several studies have been carried out in the field of traffic collisions in Iran. However, few studies have used the victims' medical records as a source of information. This study aimed to use the data collected from the medical records and a geographic information system to show the epidemiology of urban traffic collisions to be used in injury prevention strategies.

Methods: This was a descriptive, cross-sectional study which was completed in 2013. The sample consisted of 1240 medical records of the people injured in the urban traffic collisions in the capital city of Iran between October 2010 and April 2011. Data were analyzed by using SPSS 18.0 and ARC GIS 10.0.

Results: According to the results, motorcyclists were the main group of victims, and most collisions occurred in the afternoon between 12:00 and 18:00 pm. Moreover, the findings showed that the frequency of collisions was higher in District five (16.7%), District six (13.7%), and District 12 (8.3%) of the city.

Conclusion: In most traffic collisions, motorcyclists were involved and victims mainly suffered from injuries in the lower limbs. Therefore, training in the use of safety equipment, setting collision prevention strategies, and controlling the risky behavior of motorcyclists may help to reduce the number of collisions.

Keywords: injury, geographical information system, medical record, traffic collision

1. Introduction

Road traffic injures are among the main causes of deaths and disabilities. Although it is predicted that road traffic collisions will be the fifth leading cause of death by 2030, (Sehat, Holakouie Naieni, Asadi-Lari, Rahimi Foroushani, & Malek-Afzali, 2012), the pattern of road traffic collisions and deaths are different in developed and developing countries (Soori, Royanian, Zali, & Movahedinejad, 2009). According to the World Health Organization (WHO), more research is needed about the epidemiological patterns of road traffic injuries in low and middle income countries to identify risk factors and vulnerable people (World Health Organization [WHO], 2009). A world report on the road traffic injury prevention shows that following conditions are common in developing countries: the road collisions are the second leading cause of death among the young people aged 15-29 years old, the economic loss due to road traffic collisions is usually between 1% and 2% of GDP, and compared to developed countries, the number of collisions per vehicle-kilometer is about 10 to 15 times higher in developing countries (WHO, 2004). On the other hand, disabilities caused by road traffic collisions may have medical, social and economic consequences affecting the quality of life (Bilgin, Mert, & Sezgin, 2012). Such impacts are more visible among the victims, who live in developing and low-income countries.

Among different sources of information, the medical records of victims, which are kept in the hospitals and trauma centers, are valuable information resources for planning and making better decisions to prevent similar collisions in the future. For example, hospital discharge data from eight European countries showed that fractures (51.1%) and internal injuries (21.3%) are the most common injuries among pedestrians in the traffic collisions (Arregui-Dalmases, Lopez-Valdes, & Segui-Gomez, 2010). In another study, Pan et al. (2014) found that orthopedic fractures were the most common injuries (29.3%) resulted from the road traffic collisions. Therefore, exploring the pattern of injuries associated with traffic collisions can help to plan for preventing such injuries in the

future. In this case, allocating medical resources for the injured individuals can be more effective.

Apart from the importance of the risk factors leading to traffic collisions and the consequences of collisions, the location and the spatial patterns of collisions are also important for preventing traffic collisions in the future. Recently, researchers have increasingly applied geographic information systems (GIS) to gain a better understanding of the spatial distribution of collisions. Such information can help policymakers to make better decisions to prevent collisions in each region (Bell & Schuurman, 2010; Statter, Schuble, Harris-Rosado, Liu, & Quinlan, 2011; Razzak, Khan, & Jalal, 2011).

As reported by the world health organization, Iran has a high rate of death in the road traffic collision and annually, about 30 per 100,000 inhabitants are killed in collisions (World Health Organization, 2013). Hence, traffic collision death is among the first four causes of death in Iran. A variety of reasons, such as young population of the country, low fuel cost, the use of private vehicles more than public transportation, and non-standard safety designs contribute to increase the number of collisions in the country (Naghavi et al., 2009; Peymani et al., 2012). In other words, the youth may show more risky behavior when driving and the low fuel cost may encourage them to use private vehicles instead of public transportation which can lead to an increase in the number of incidents. As the victims are mostly in the age group of 10- 30 years old who have the highest work efficiency during these years, it necessitates careful planning to identify and control factors causing collisions. Of course, this would be possible only by having access to the accurate and precise collision data (Moafian et al., 2013; Ayatollahi et al, 2013; Ayatollahi et al., 2009).

To date, several studies have been conducted in the field of traffic collisions in Iran and most of them have focused on the epidemiology of these events. However, few studies have used the victims' medical records as a source of information or the geographic data to show the pattern of collisions. Therefore, this study aimed to use the medical records data and GIS to show the epidemiology of traffic collisions in Tehran, the capital of Iran for being used in injury prevention strategies.

Tehran is one of the 10 largest cities in the world. It is located on the southern slopes of Alborz mountain, and in approximately equal distance from eastern (Afghanistan) and western (Turkey, Iraq) borders. The population of the city is around 9 million in the city and 16 million in the wider metropolitan area. The city of Tehran is divided into 22 municipal districts, each with its own administrative center who report to the mayor of Tehran metropolitan. (Tehran municipality, 2016a)

2. Methods

This was a descriptive, cross-sectional study which was completed in 2013. In this study, no sampling method was used; however, due to the large number of collisions reported annually in Tehran, the capital city of Iran, a number of inclusion/exclusion criteria were considered to include the eligible hospitals and victims' medical records. For example, private hospitals were excluded and only eight public hospitals, which had a trauma center and admitted the injured individuals, were included in the study. Moreover, in order to show the geographic distribution of traffic collisions, only medical records with information about the location of the collision were included in the study (n=1356). It is notable that in Iran, a police report is also attached to the medical records of the victims of traffic collisions to show the location or the cause of collision. Among the records noted above, there were medical records (n=116) in which the information about the location of the collision was too general/vague. These records were also excluded from the study. The final sample consisted of 1240 medical records of people who were injured in the traffic collisions in the urban areas of Tehran between October 2010 and April 2011. Before conducting the research, the proposal was reviewed by the institutional review board and ethics approval was obtained from the university ethics committee.

Data were collected by three researchers (MRK, MH, HA). Initially, a list of the victims of the traffic collisions was extracted from the hospital information system in each hospital. Then, the paper-based medical records of the victims were retrieved and reviewed to identify the records in which the location of the collision was reported. Finally, the required data were collected using a form with the following items: patient number, age, sex, marital status, level of education, type of trauma, type of the injured individual, type of vehicle, place of collision, time of collision, cause of collision, site of injury, and the discharge status of the injured individual. To classify the type of trauma and the type of the injured individual, international classification of diseases- version 10 (ICD-10) was used. ICD-10 is a standard diagnostic tool for epidemiology, health management and clinical purposes, and contains guidelines for recording and coding health related problems. It is used by clinicians, healthcare providers and health information managers to monitor the incidence and prevalence of diseases and other health problems (World Health Organization, 2016). It is notable that the level of education was removed later from the list of the items, as it had not been completed in most medical records. Data were analyzed using SPSS 18.0 and ARC GIS

10.0 to show the spatial pattern of traffic collisions. The chi-square test was used to test the association between the selected variables.

3. Results

The findings of the study showed that a majority of the injured people in the collisions were men (n=1044, 84.2%) and among them (n=524, 42.3%) were married. As Table 1 shows, the age range of the majority of the injured people (n=664, 53.5%) was between 20 and 39 years old and the lowest frequency (n=18, 1.5%) was related to the age range of 80 to 99 years old.

Table 1. Frequency of the victims' characteristics

Variables	Frequency
Sex	
Male	1044 (84.2%)
Female	196 (15.8%)
Marriage status	
Married Male	524 (42.3%)
Married Female	100 (8%)
Age	
0-19	186 (15.5%)
20-39	664 (53.5%)
40-59	269 (21.2%)
60-79	103 (8.3%)
80-99	18 (1.5%)
Type of the injured person	
Driver	116 (9.4%)
Passenger	84(6.8%)
Pedestrian	506(40.8%)
Cyclist	5 (0.4%)
Motorcyclist	514(41.5%)
Unknown	15(1.1%)

Regarding the type of the injured individual, the highest frequency (n=514, 41.5%) belonged to motorcyclists followed by pedestrians (n=506, 40.8%) and the lowest frequency (n=5, 0.4%) was related to the cyclists. The most frequent type of vehicle involved in the collisions (n= 681, 54.9%) was car followed by motorcycle (n=312, 25.1%) and the lowest frequency (n=5, 0.5%) belonged to bicycles. (Table 2)

Table 2. Type of vehicles involved in the collisions

Sex / Type of vehicles	Female Driver	Male Driver	Total
Car	116 (9.3%)	565 (45.6%)	681 (54.9%)
Truck	1 (0.1%)	27 (2.1%)	28 (2.2%)
Heavy vehicle	0	26 (2.1%)	26 (2.1%)
Bus and minibus	0	28 (2.3%)	28 (2.3%)
Motorcycle	0	312 (25.1%)	312 (25.1%)
Bicycle	0	5 (0.5%)	5 (0.5%)
Unknown	24 (1.9%)	136 (11%)	160 (12.9%)
Total	196 (15.8%)	1044(84.2%)	1240 (100%)

The results showed that the highest frequency of collisions (n= 448, 36%) occurred in the afternoon between 12:00 and 18:00 pm. It was followed by the second high frequency category (n= 373, 30%) which showed the number of

collisions between 18:00 pm and 24:00 pm. Moreover, most collisions occurred during autumn (n=785, 64%) and in October (n=340, 27.6%). According to the information provided in the medical records or in the police reports, the highest frequency of the cause of collisions was related to paying insufficient attention to the traffic rules and the reckless actions of drivers (n=627, 50.6%). The lowest frequency belonged to the sleepiness of a driver (n=3, 0.2%). In terms of the site of injury, the highest frequency was related to the injuries of lower limbs (pelvic, thigh and leg) (n=511, 41.2%) and multiple sites injuries (n=208, 16.8%). (Table 3)

Table 3. Frequency of the victims' site of injuries

Sex / Site of injuries	Female	Male	Total
Head and face	32 (2.6%)	132 (10.6%)	164 (13.2%)
Back, chest, abdomen	12 (1%)	70 (5.6%)	82 (6.6%)
Shoulder, arm and forearm	28 (2.3%)	109 (8.8%)	137 (11.1%)
Wrist, hand and finger	12 (1%)	58 (4.6%)	70 (5.6%)
Pelvic, thigh and leg	76 (6.1%)	435 (35.1%)	511 (41.2%)
Ankle, foot and toe	6 (0.5%)	62 (5%)	68 (5.5%)
Multiple sites	30 (2.4%)	178 (14.4%)	208 (16.8%)
Total	196 (15.8%)	1044(84.2%)	1240 (100%)

Moreover, the most common medical procedures (n=893, 72%) was related to the orthopedic specialty. The findings showed that the discharge status of patients was not recorded in most cases (n=1017, 82%). However, among the completed records, the highest frequency (n=118, 9.5%) was related to the patient follow up in the same hospital and the lowest frequency (n=3, 0.2%) was related to transferring patients to other hospitals.

Chi square tests showed that there was a relationship between the age group and the type of the injured people who were mostly motorcyclists (X^2=1.15, p<0.001), the age group and the cause of collision (X^2=60.4, p<0.001) and the age group and the site of injury (X^2=43.1, p=0.009). It means that the victims aged 20-39 years old were mostly motorcyclists. At this age range, the reckless actions and paying inadequate attention to the traffic rules were common and after collision, they mainly suffered from lower limb injuries. However, there was no association between the age group and the time of collision (X^2=19.2, p=0.25) and the sex and the cause of collision (X^2=7.43, p=0.19).

In order to display the geographical distribution of the collisions in different Districts of the city, the spatial data of each collision were obtained using the city electronic map. Among 22 municipality Districts, the findings showed that most collisions (n=208, 16.7%) occurred in District 5, followed by District 6 (n=170, 13.7%) and District 12 (n=103, 8.3%) (Figure 1). The lowest frequency of collisions (n=3, 0.2%) was related to District 1. Also, there was a statistically significant difference between the number of collisions in different Districts (p <0.001).

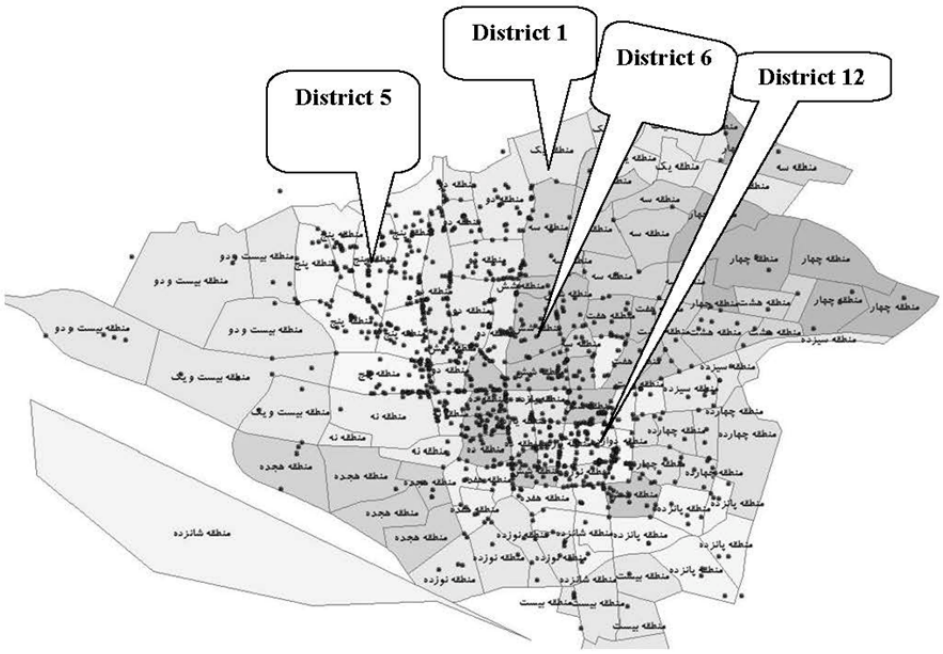

Figure 1. Distribution of traffic accidents in 22 municipalitydistricts

4. Discussion

Annually, a large number of people are injured in traffic collisions. The results of the current study showed that most of the victims of the urban traffic collisions in Tehran were married men aging 20-39 years old. This finding is similar to the results of another study which showed that the highest frequency of victims belonged to men (82%) (Ghadipasha, Salari, Zarenezhad, Dehghanpour, & Gharedaghi, 2013). Regarding the age range of the injured people, the findings are in line with the results of other similar studies conducted in Iran (Cameron et al., 2005; Nizamo, Meyrowitsch, Zacarias, & Konradsen, 2006; Adib Zadeh, Ghadi Pasha, & Bastani, 2011; Ghadipasha, Salari, Zarenezhad, Dehghanpour, & Gharedaghi, 2013). It is notable that the age range of 20-39 can be the best years of life to be productive and generate income. People at these ages are more active with a tendency to take risks. Furthermore, males are often regarded as the predominant working class and because of that they are more active and outgoing (Monga et al., 2015). Therefore, the families of those who are killed in the collisions encounter financial difficulties and their life styles are significantly affected. Considering the mean age of the victims of traffic collisions in other countries, it seems that ignoring the principles of safety, especially by the youth leads to a lower mean age among the victims in Iran (Khosravi Shadmani, Soori, Zayeri, Eini, & Mehmandar, 2012). Although, the use of helmet and having driving license is compulsory for the motorcyclists in the country, Zamani-Alavijeh et al. (2011) showed that only 10% of motorcyclists wore a standard helmet. Moreover, 23% of motorcyclists used non-standard or partial helmets that covered only part of the head and did not prevent head trauma injuries effectively. As there are between 3 and 3.5 million motorcycles in Tehran, and a number of motorcyclists may not have a driving license, it seems that more injury prevention strategies, such as training traffic safety programs to the youth and who are at the age of early-to- middle adolescence as well as financial and non-financial punishments for disobeying traffic rules might help to reduce the number of traffic collisions among this group of people.

According to the results, most of the injured individuals in the urban traffic collisions were motorcyclists and pedestrians. Moreover the results showed that the injured people at the age of 20 to 39 were more likely to be motorcyclists. The results are consistent with other similar studies (Salari, Pirayeh Haddad, & Aghili, 2002; Khatami et al., 2003; Fazel, Tabesh, & Azordegan, 2008) in which motorcyclists were found the most vulnerable group of the injured people. Hashemiparast et al. (2016) noted that pedestrians are one of the most vulnerable road users and are more at risk than the other groups such as cyclists and drivers. The main reasons for pedestrian injuries can be poor decisions or risky behaviors during road crossings (Hashemiparast et al., 2016). In another study conducted in Australia, the researchers found that riders, passengers, and pedestrians were the most vulnerable victims (Cameron et al., 2005). Similarly, the findings of a study in China showed that motorcyclists, bicycle riders, and pedestrians were the most victims of traffic collisions (Qi, Yang, Qi, Zhang, & Wang, 2006). It

is notable that motorcycle collisions and their related injuries are major problems in developing countries (Heydari et al., 2016). In Iran and especially in Tehran, a large number of motorcyclists use their vehicles for transportation or earning money. Also, young people use motorcycle to get rid of traffic congestions. However, many riders are not familiar with traffic rules or ignore them which may cause a large number of traffic collisions. Risky driving behaviors, such as using a mobile phone when driving, driving over the speed limit, carelessness about driving and not wearing a helmet are also among other reasons that a large number motorcyclists are injured (Solagberu et al., 2006). It seems that providing safety plans and training can be useful to prevent traffic injuries among motorcyclists and pedestrians.

According to the results, most of the collisions were caused by car drivers. Considering the most injured people in the collisions who were motorcyclists, it seems that a large number of collisions happened between cars and motorcycles. Again, this might be due to the speed and unsafe driving either by motorcyclists or by car drivers. In this regard, the results of a study on the behavior of motorcyclists and a similar group of car drivers showed that motorcyclists are younger than car drivers and they run faster, overtake, and pass through narrow ways more than car drivers (Lateef, 2002; Horswill & Helman, 2003). Moreover, the motorcyclists sometimes show risky behaviors due to the social and environmental issues, and the type and the quality of their safety equipment, and the type of the motorcycle may expose them to the collisions. Therefore, they cause most of the collisions (Zamani-Alavijeh et al., 2010). Other studies also show that motorcyclists have the highest contribution in the urban and suburban traffic collisions (Khosravi Shadmani, Soori, Zayeri, Eini, & Mehmandar, 2012). Therefore, developing injury prevention strategies can be performed by focusing on a specific group of road users, such as motorcyclists and their requirements.

In terms of the time of traffic collisions, the findings showed that most collisions occurred between noon and evening. The lowest frequency of collisions happened between the midnight and 6:00 am and there was no relationship between the sex of the injured people and the time of collision. Similarly, in a study conducted by Heydari et al. (2013), the results showed that the risk of fatal collisions was higher between 16:00 pm to 19:59 pm. The reason for a large number of traffic collisions between noon and evening might be traffic jams, the tiredness of drivers or increased human activities during that time. Obviously, knowing the time of injury is important for prevention strategies. Such data can help to plan for rapid arrival of the emergency medical services (EMS) at the scene and proper victim transportation (Chalya et al., 2012). Moreover, more resources can be allocated to control traffic during this period of time.

In this study, the causes of traffic collisions were grouped into five categories: infringement and recklessness, sleepiness, drug use, inadequacy of traffic signs, and faulty vehicle. The findings of the study showed that most collisions happened by reckless drivers and due to breeching the traffic rules. Among causes of collisions, the lowest frequency was related to the drivers' sleepiness. Moreover, the results showed that breeching the traffic rules was more common among the motorcyclists and the people at the age of 20 to 39. According to the literature, the common causes of collisions in the low income countries are human factors including drivers' errors or their risky driving behaviors, road problems, weather problems, drug use, and so on. The traditional view about the road safety suggests that drivers are usually responsible for the road traffic collisions. It is estimated that human factors are the main cause of 64% to 95% of collisions in developing countries (Fazel, Tabesh, & Azordegan, 2008). In Iran, among the most important factors that may contribute to traffic collisions, namely; human, vehicle, road and environment, human is accounted as the most important factor (Haghi, Ketabi, Ghanbari, & Rajabi, 2014). However, there might be many other factors, such as road characteristics and vehicle specifications that influence driving and cause collisions. In the current study, as there was no specific source of information to determine the causes of collisions with certainty, they were extracted from the police reports and classified. Although they might be determined based on the self-reported data, such as the victim's perception, they were classified based on the findings of similar studies. To establish injury prevention strategies and to control the causes of collisions, traffic safety training, strict punishments, and increasing pedestrian's and bicyclist's visibility to prevent crashes are suggested (Bayan, Bhawalkar, Jadhav, & Banerjee, 2013).

According to the findings, injuries in the lower limbs had the highest frequency among other injuries. In addition, there was a relationship between the age group and the site of injury indicating that motorcyclists and people at the age of 20 to 39 were more likely to be injured in the lower limbs during a collision. Similarly, other researchers showed that the highest frequency of injuries were in the shaft and upper part of tibia (Ghadipasha, Salari, Zarenezhad, Dehghanpour, & Gharedaghi, 2013). Lateef (2002) showed that tibia and fibula fractures are common in combination. However, the femur fracture occurs less frequently. It should be noted that apart from physical injuries, collisions may affect personal life, especially professional life, and coping with the negative impacts may cause many psychological problems that should be taken into account (Rus, Peek-Asa, Baragan, Chereches, & Mocean, 2015). Other issues which need to be considered are related to providing healthcare services for the

injured people. According to Haghparast-Bidgoli et al., in Iran, there is a lack of a systematic approach to provide trauma care at emergency departments (EDs), inappropriate structure and unsupportive environment of hospitals and a limited number of professional staff at EDs (Haghparast-Bidgoli, Khankeh, Johansson, Yarmohammadian, & Hasselberg, 2013). Therefore, providing healthcare services to the victims can be challenging, and more medical resources should be available in the trauma centers to deal with the injured people, especially during rush hours.

In this study, the geographical distribution of traffic collisions was compared across 22 municipality Districts of the city. According to the findings, most collisions occurred in Districts five, six, and 12. District five is located close to the north west of the city and compared with the central and the southern parts of the city, it is a quite large residential area. District five has proper environment and appropriate platform that have contributed to the formation of the area. The District has social stability with high quality of urban environment and social welfare (Tehran municipality, 2016b).

District six is located in the central part of the city and is among the oldest Districts. More than 30% of commercial and educational buildings are located in this district and the residential congestion is about 75% (Tehran municipality, 2016c). District 12 is located in the south of District six and the biggest shopping center "Bazar" is located in this District. Compare to District five which was a residential zone, District 12 is a commercial zone and the quality of life and social welfare need to be improved in this District (Tehran municipality, 2016d). A large number of collisions in the above mentioned Districts might be due to the specification of each District. For example, in District five risky driving behavior and driving over speed limit might be the cause of collisions. In District six, traffic congestion and a large number of commuters might be the reasons for traffic collisions. In District 12, traffic collisions may occur due to the traffic congestion or the socio-economic and cultural status of the District. Another cause of collisions in this District might be related to the large number of trucks and vans that load or unload goods. In these vehicles, drivers may not be able to see smaller vehicles like motorcycles, and collisions between them are inevitable (Khosravi Shadmani, Soori, Zayeri, Eini, & Mehmandar, 2012). Moreover, people from different cities may come to this District for buying or selling their goods. As they might be unfamiliar with the streets and there might not be adequate traffic signs, the occurrence of traffic collisions are expected in this District. It is also worth mentioning that the injury characteristics for road traffic collisions in developing countries differs from the features seen in developed countries, and it can provide guidance for making policies to improve prevention and control (Haghparast-Bidgoli, Khankeh, Johansson, Yarmohammadian, & Hasselberg, 2013). For example, in developing countries, policies on traffic safety should be based on the local evidence and designed for the particular group and economic circumstances.

In the current study, the health and the geographic data both were analyzed to provide more details about traffic accidents in Tehran, and to emphasize the role of these data for future healthcare planning and decision making. The health-related data are of high importance to provide health care services and to allocate resources efficiently. The use of GIS helped us to identify urban Districts in which there was a higher frequency of traffic collisions. Future studies may focus on analyzing factors that may contribute to these collisions e.g., socio-economic status, cultural status, transportation infrastructure, etc. in order to develop more effective injury prevention strategies for each District. Moreover, urban planners may consider environmental engineering measures in these Districts to reduce the incidence of collisions and injuries.

4.1 Limitations of the Study

One of the limitations of this study was resources restriction which prevented the researchers to deal with a large volume of data. To cope with that, the researchers set a number of exclusion criteria to be able to conduct the research. For example, while many private hospitals might initially admit the injured individuals, only hospitals which had a trauma center were selected. It is also notable that the victims of traffic collisions are usually transferred to the trauma centers and excluding private hospitals may not significantly influence the results. Moreover, due to the lack of information about the location of traffic collisions, 116 medical records were excluded from the study. In these records, either there was no information about the location of the collision or it was too general/vague. The lack of information was resulted from improper traffic information management and there were no other sources to identify the correct addresses.

Although the police reports were used to get more information about the location and the cause of collisions in this study, the cause of collisions might be determined on the basis of the police judgment or the victim's perception. As the cause of collision is a rather subjective matter in nature, it is difficult to come to a conclusive result. However, as there was no other sources of information in this study, the causes of collisions were extracted from the police reports. This helped to analyze related data and to propose injury prevention strategies.

In this study, the medical records of the injured people who were hospitalized were investigated. There might be a number of collisions that the victims had died before reaching the hospitals. For this group of the victims, the

reason for death and the collision information were recorded in the pre-hospital records or the police report. These sources of information can be used in the future studies.

Another limitation might be related to the data which are not very recent. Although the overall number of collisions has been recently reduced in some areas of the country, the findings of the current research are still in line with the results of other recent studies in which the results show motorcyclists are the main group of victims and other related issues are relatively the same.

5. Conclusion

The present study showed that in most urban traffic collisions in Tehran, married male motorcyclists were involved, and a large number of collisions happened in Districts five, six and 12. Most collisions occurred between noon and evening and victims mainly suffered from injuries in the lower limbs. The results indicated that the victims were mainly married and responsible for providing financial support for the family. As a result, they were more active, outgoing, and exposed to the collisions. This shows that not only the victims, but also their family might be affected; thus, preventive strategies need to be set. Motorcyclists should be trained in using safety equipment and controlling their risky behavior. Collision prevention strategies and penalties for traffic offences, such as fines, disqualification from holding or applying for a license, and license cancellation may also help to reduce the number of collisions. Even, pedestrians who may cause traffic collisions should be fined for breaching the traffic laws. Not only motorcyclists and pedestrians, but also all community members need to be informed about the traffic laws and traffic offence punishments.

With respect to the time of collisions, more concentration on the traffic control between noon and evening and providing more medical services to help the victims during the rush hours can help to manage traffic collisions more effectively. In addition, before setting injury prevention and safety strategies, it is necessary to identify high-risk Districts in the city as well as the social, cultural, and economic circumstances in each District. This can help to focus on the main risk factors, to allocate resources more effectively, and to be successful in controlling traffic injuries. Finally, policy changes can be evaluated through interviews with travelers, government officials, and health experts to be able to set more accurate and pragmatic recommendations.

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Competing Interests Statement

The authors declare that there is no conflict of interests regarding the publication of this paper.

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