Doi: 10.32592/jorar.2022.14.3.1

Assessment of Traffic Accidents Referred to Hospitals and Forensic Medicine Department in Nikshahr, Iran, between 2014-2018

Ramazan Mirzaei[1], Saydi Baluchi[2], Mohammad Nourmohammadi[1], Ebrahim Taban[1], Zahra Rezvani[1]

Date of submission: 08 Dec. 2020 *Date of acceptance: 21 Jun.2022*

Original Article

Abstract

INTRODUCTION: Iran, especially the Sistan-Baluchestan province, is one of the countries with the highest rates of accidents and traffic-related deaths. The present study aimed to evaluate traffic accidents referred to hospitals and the Forensic Medicine Department in Nikshahr in Sistan-Baluchestan province, Iran, during 2014-2018.

METHODS: In this retrospective descriptive and analytical study, the statistical population included traffic accidents referred to hospitals and the Department of Forensic Medicine in Nikshahr. The data related to the variables of age, gender, location of the accident (inside or outside urban areas, rural roads), condition of the injured, severity of the injury, and the time of the accident were collected using a checklist. After determining the descriptive statistical indicators, the incidents were analyzed using chi-square and correlation tests.

FINDINGS: During the study years in Nikshahr, a total of 3,669 people were involved in road accidents, out of whom 339 cases lost their lives. The highest rate of accidents (36%; n=1321) was in the age group of 19-29 years. Regarding education, 3, 260 (88.8%) crash victims were illiterate and without a university degree, while 409 (11.15%) cases had academic education. It was also detected that 1,879 (51.2%) accident victims were motorcycle riders with reported fractures, severe injuries, head injuries, and death.

CONCLUSION: The results of the current pointed to the high rate of traffic-related deaths in Nikshahr, especially in summer. Therefore, prevention management is necessary to reduce traffic accidents and fatalities.

Keywords: Epidemiology; Mortality; Nikshahr; Traffic Accidents.

How to cite this article: Mirzaei R, Baluchi S, Nourmohammadi M, Taban E, Rezvani Z. **Assessment of Traffic Accidents Referred to Hospitals and Forensic Medicine Department In Nikshahr, Iran, between 2014-2018.** Sci J Rescue Relief 2022; 14(3): 156-62.

Introduction

Road traffic accidents are a major health problem, endangering people's lives. The injuries caused by these incidents are so widespread that they are referred to as wars of the roads (1). The dramatic increase in traffic accidents is recently one of the most severe threats presented to sustainable development and public health. In 1988, 51% of fatalities and 59% of disabilities related to traffic accidents occurred in the productive age (15-44 years old) (2). Among the reasons that can be cited for the increase in traffic accidents in developing countries, we can refer to increased number of vehicles. For instance, in Vietnam, the increase in the number of vehicles has been associated with an elevation in the number of deaths and injuries (3).

In developing countries, traffic control status is also one of the influential factors affecting the increase in traffic accidents (4). Moreover, the inadequate health infrastructure in developing countries impedes timely access for the injured to emergency services and increases the traffic-related death rate (5). The injuries caused by these incidents are so extensive that they are referred to as the war of roads (1).

1- Assistant Professor, Mashhad University of Medical Sciences, Social Determinants of Health Research Center, Mashhad, Iran
2- MS Islamic Azad University of Zahedan, Faculty of Engineering, Islamic Azad University of Zahedan, Zahedan, Iran
Correspondence to: Zahra Rezvani, Email: RezvaniZ@mums.ac.ir

Traffic accidents and injuries are one of the significant causes of death and disability in developing countries (5). Road traffic accidents are the ninth leading cause of death across the globe, and it is expected to rise to third place by 2020 (2). Human casualties are the worst consequence of traffic accidents. The number of traffic deaths is on the rise in developing and even developed countries (6).

Approximately 5.8 million people die from injuries each year, accounting for 10% of the world's deaths (7). The death rate from accidents is increasing rapidly in low-income and middle-income countries, and it is predicted that road traffic deaths will increase to 4.8 million people by 2020 (4). Iran has one of the highest death rates from road accidents, which have led to increased direct and indirect costs, mental problems and depression in family members, and loss of permanent or temporary active workforce (8). According to research conducted in Iran, traffic accidents are the third most common cause of death in 2018 (2, 7).

In a study investigating the causes of death in traffic accident patients referred to Vali Asr Hospital in Arak, based on oral autopsy and forensic autopsy in 2016, out of 8,153 traffic accident patients referred to Vali Asr Arak Hospital, 109 (1.33%) patients died (9). In the study of factors affecting road accident-related deaths in Iran, researchers concluded that gross domestic product has a negative effect on the number of fatalities (10). According to the Forensic Medicine Organization of the country, the Sistan-Baluchestan province has the highest rate of accidents-caused deaths (11).

Therefore, considering the high rate of traffic accidents, as well as its personal, social, and economic consequences, regional deprivation, and social and cultural conditions, it is necessary to identify and evaluate the existing situation in this city in order to make plans for the control and reduction of the burden of road traffic injuries. In light of the aforementioned issues, the present study aimed at epidemiological evaluation of traffic accidents referred to hospitals and the Forensic Medicine Department in Nikshahr in Sistan-Baluchestan province during 2014-2018 in order to identify the most critical causes of accident-related death in terms of the severity of injuries to adopt general and preventive policies.

Methods

In this retrospective descriptive and analytical study, the statistical population included traffic accidents referred to hospitals and the Department of Forensic Medicine in Nikshahr during 2014-2018. The participants were selected via total population sampling, and secondary data collection was performed by using traffic accident files referred to 22 Bahman Hospital, which is the only public hospital in Nikshahr, and data datasets of the Forensic Medicine Department of Nikshahr. The collected data was obtained using a checklist from the files available in hospitals and the Forensic Medicine Department.

In this study, traffic accidents were extracted by age, gender, education, type of activity, the vehicle used, and vehicle involved with the pedestrian or the deceased person's vehicle. Furthermore, the frequency of the impact location, the final cause of death, the condition of the deceased at the time of the accident (driver, pedestrian, or passenger), the place of death, the manner of collision (vehicle collision, vehicle crash involving a vehicle and a pedestrian), lighting conditions, location of the accident (inside or outside the city) were also investigated. The data were analyzed in SPSS software. The descriptive statistical indicators of mean, standard deviation, frequency, and percentage were calculated and analyzed using chi-square and correlation tests.

Findings

Based on the results, during the study years, traffic accidents claimed the lives of 3,669 people. The highest percentage of traffic accident victims referred to the hospital and Forensic Medicine of Nikshahr during 2014-2018 was related to the age groups of 19-29 years (36%; n=1,321) (Table 1).

The Chi-square test demonstrated a difference between road traffic victims referred to the hospital and Forensic Medicine Department of Nikshahr during 2014-2018 in different age groups. Moreover, accidents and deaths were significantly higher in the age group of 19-29 years ($P=0.001$) compared to those in other age groups. In total, between 2014-2018, 339 people lost their lives due to accidents in this city (Table 2).

According to the results, out of 3,669 crash-affected people, 1,729 (47.1%) and 1,940 (52.9%) cases were single and married, respectively. Moreover, 243 (6.6%), 1712 (46.7%), and 1714

[DOI: 10.32592/jorar.2022.14.3.1]

Table 1. Rate of accident victims during 2014-2018 in the city by age groups

Age group (years)	0-5	6-18	19-29	30-59	60 & upper
Frequency	257	991	1321	917	183
Rate	7	27	36	25	5

Table 2. Percentage of accident-related death and injuries in Nikshahr during the years 2014-2018

Year	1393	1394	1395	1396	1397
Frequency of injured people	628	664	593	750	695
Rate of injured people	91%	91%	93%	89%	92%
Frequency of the deceased	65	63	53	97	61
Rate of the deceased	%9	9%	8%	11%	8%

(46.72%) cases had accidents in the city, non-urban roads, and rural roads, respectively (Figure 1).Regarding the accident victim, 587(16%) were, 1073 (29.2%), and 1879 (51.2%) cases were drivers, passengers, and motorcycle riders, respectively.

Figure 2 shows frequency percentage of the studied accident victims according to the person's position at the time of the accident by year in Nikshahr during the years 2014-2018

As illustrated in Figure 3, 339 (9.2%) and 213 (5.8%) accident victims died and had head

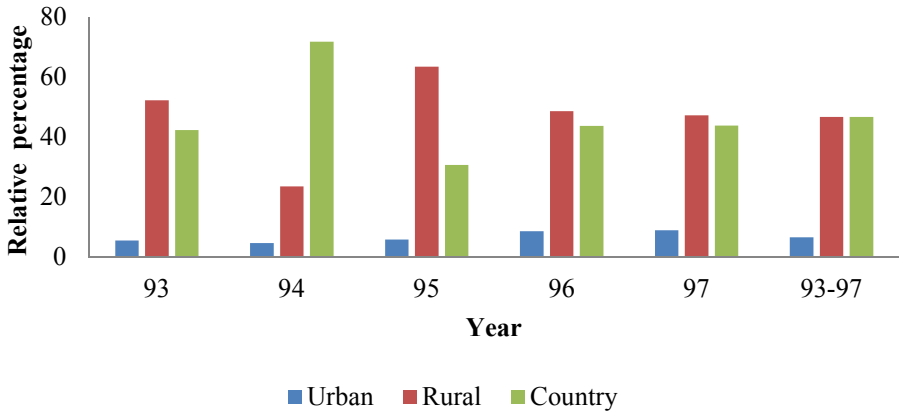

Figure 1. Relative frequency distribution of accidents according to the location and year in Nikshahr

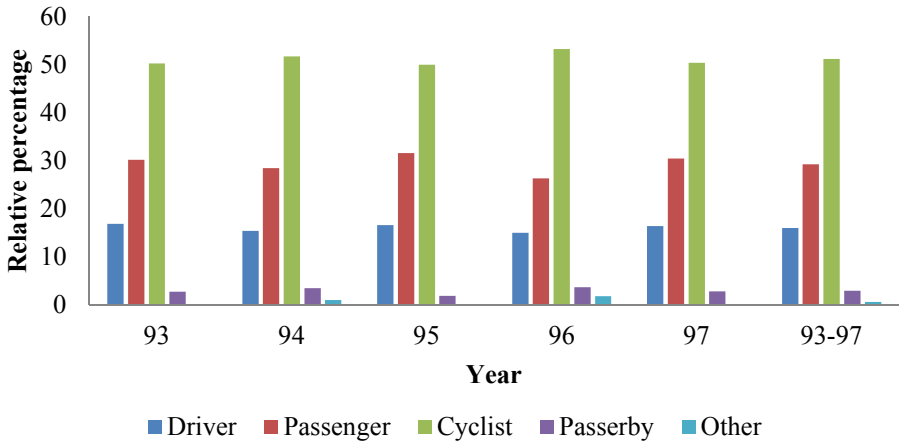

Figure 2. Relative percentage of the traffic victims according to the person's position at the time of the accident by year in the city of Nikshahr

[DOI: 10.32592/jorar.2022.14.3.1]

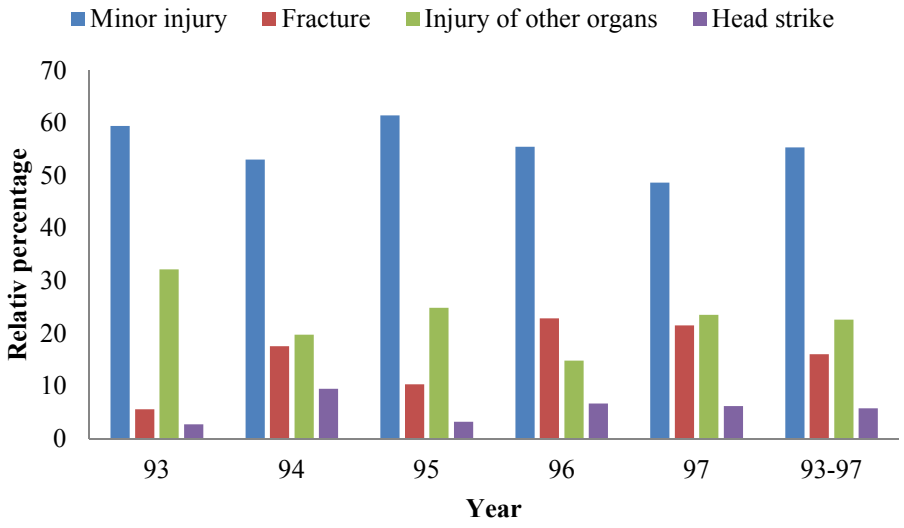

Figure 3. Relative percentage of traffic victims according to the type of injury in Nikshahr during the years 2014-2018

injuries, respectively.

The Chi-square test demonstrated that the percentage of accident victims was higher in summer than in other seasons, and a significant difference was found between the rates of accident victims in different seasons (*P=0.001*). In addition, 67.8% and 32.2% of accidents occurred during the day and night, respectively. The most common causes of traffic accidents were vehicle overturning (78.1%; n=2867), motor vehicle collisions (11.75%; n=431), and pedestrian accidents (2.67%; n=97).

The Chi-square test showed that the percentage of accident victims due to overturning was higher. There was a significant difference between the frequency of accident victims due to overturning compared to other causes (P=0.001). Moreover, the treatment costs of traffic accidents referred to the hospital (cash and insurance) amount to 490,593,917,389 Rials, apart from the loss of life (Diya) and financial loss (damage to vehicles) (Figure 4).

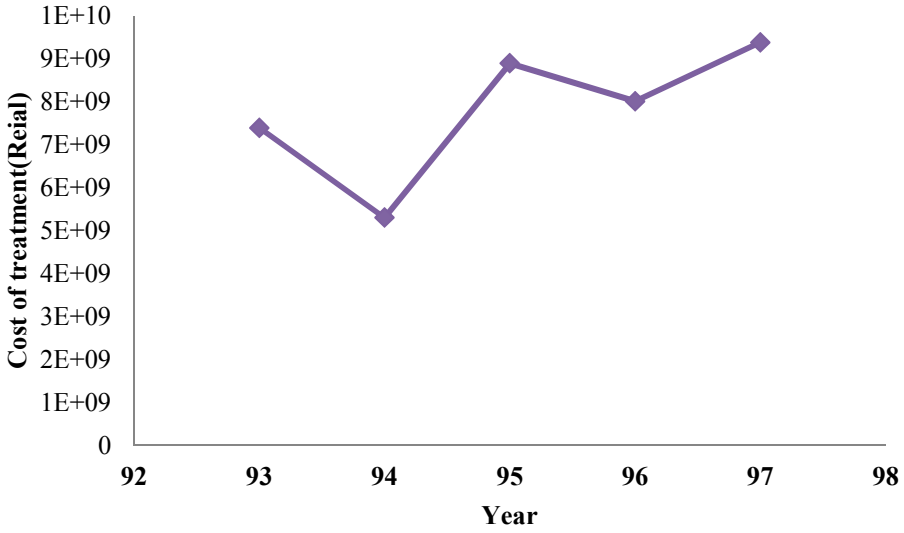

Figure 4. Treatment costs of traffic accidents referred to the hospital in Nikshahr between 2014 to 2018

[DOI: 10.32592/jorar.2022.14.3.1]

Discussion and Conclusion

The results of the present study pointed out that during the years 2014-2018, a total of 3,669 people were involved in road accidents in Nikshahr, out of whom 339 cases died. The majority of the victims and deceased people were men and married. These findings are in line with those obtained by Davoudi et al., who reported that 553 people died as a result of road traffic crashes in Lorestan province in 2011, and the highest number of deceased people were men (87.37%) and married. (65.94%). It was also reported that most of them died at the accident scene due to head injuries (12).

These results are consistent with those reported in a study conducted by Kasmai et al. in Gilan (13, 14). The findings of this research illustrated that the majority of deceased people were in the age range of 19-29 years which is economically the most active group of the society whose fatality inflicts the most irreparable damage to the country's economy. The study of traffic accidents leading to death in Ardabil province also demonstrated that the highest rate of traffic accidents pertained to the age range of 21-30 years (15). In accordance with the results of the present research, the findings of a study by Sukhaei et al. indicated that fatal traffic accidents were mostly related to men and young people (16).

In addition, the results of a study by Komai et al. in Gilan demonstrated that the highest rate of traffic-related death was in the age group of 18-24 years (13). Along the same lines, in their study, Barzegar et al. (17) in Kermanshah estimated the highest number of car accidents in the age group of 20-40 years. In this study, illiterate people or those with low levels of literacy had a much higher rate of accidents compared to people with academic education. This finding is in line with those obtained by Ghorbani et al., who showed that illiterate and university-educated people had the highest and lowest rates of car accidents, respectively. The findings of other studies are also consistent with the results of the present research (15, 18, 19).

Consistent with the results of the research by Davoudi et al. (12), the findings of the current study pointed out that the most traffic accident referred to the hospital in the studied years in this city occurred during the daytime hours on non-rural and rural roads. Moreover, this research has demonstrated that the majority of injured people in traffic accidents were motorcycle riders. In addition, in line with the results of a study by Kasmai et al., vehicle occupants had the highest rate of accidents on non-urban roads. A recent study showed that 21.5% of injuries are related to head injuries and fractures. In the study by Davoudi, it was also stated that the leading causes of death were head trauma, multiple fractures, and hemorrhage (12).

As confirmed by multiple studies, since the brain is susceptible and vulnerable, injury to this organ resulted in death in more than half of the cases (17, 20) and head injuries are the leading cause of death in motorcycle crashes (21). In the study by Kasmai et al. (13), the majority (63.6%) of traffic accidents in 2011-2012 in Gilan led to severe injuries and hospitalization, while 6.6 36% of the cases suffered from minor injuries and were treated on an outpatient basis. Moreover, 0.2% of the patients were maimed due to the violation of driving rules. These results are in contrast with the present study and this discrepancy can be ascribed to the severity of the accidents.

Consistent with the studies conducted in Gilan (13), Golestan (22), Isfahan (23), and Bandar Abbas (24), in the present research, most of the people injured in traffic accidents were motorcyclists. It is also in agreement with the studies by Ghorbani et al., who stated that motorcycles account for the majority of accidents (19). In a similar vein, in Germany and Italy, the use of motorcycles has been the cause of numerous traffic accidents (25). In confirmation of these results, Bachani et al. concluded that focusing on the use of helmets and the speed limit law can prevent many accidents, injuries, and traffic fatalities (26).

The results of the current research indicated that drivers and passengers were the majority of accident victims. In line with this result, the study by Davoudi et al. has pointed out that car passengers and drivers constitute the greatest number of traffic accident victims (12). This can be attributed to the non-use of seat belts, violation of traffic rules, and poor traffic control and supervision. Along the same lines, in their study, Valent et al. attributed the causalities to the non-use of seatbelts (25). In accordance with the study by Entezami, the findings of the current research indicated that the largest number of motor vehicle

[DOI: 10.32592/jorar.2022.14.3.1]

crash deaths occurred among the occupants of passenger vehicles (27). This may be due to the larger number of this type of vehicle compared to other vehicles, improper road design, as well as non-standard passenger vehicles and their high speed.

Consistent with the results of the studies conducted in Gilan (13), Golestan (22), and Isfahan (23), the present study suggested that the highest rate of traffic accidents in Nikshahr in the studied years was related to summer. Moreover, 33%, 38%, and 33% of accidents in Gilan, Isfahan, and Golestan provinces happened in the summer, respectively. Contrary to the results of the present research, in the study by Davoudi et al. (12), the highest rate of road accidents was in spring and autumn. This discrepancy can be ascribed to differences in the geographical and climatic conditions in these areas, especially during tourist seasons. According to the results of this research, traffic-related death rate in Nikshahr city is high.

The highest number of road and rural accidents occur among young people in the age group of 19-29 years. The mitigation of accidents requires the improvement of suburban and rural road engineering, installing cameras to monitor compliance with traffic laws, as well as the presence of traffic police. Head injuries have been reported as the cause of death among many accident victims, including motorcyclists. The use of personal protective equipment and the enforcement of regulations will be helpful in this regard. Furthermore, based on the results of this research, the most common cause of accidents was vehicle overturning. It is necessary to evaluate the underlying causes and take the required measures to eliminate them.

Acknowledgments

The authors would like to express their gratitude to all those who contributed to the conduction of this research project.

Conflict of Interests

The authors declare that there is no conflict of interest in this study.

References

1. Robert I, Mohan D, Abbasi K. War on the road. BMJ 2002; 324(7346): 7-8.
2. Amani F, Kazemnejad A, Habibi R, Hajizadeh E. Major cause of mortality trends in Iran .J Gorgan Univ Med Sci 2010; 12 (4): 1971-85. (In Persian)
3. Amiresmaili M, Esfandiari A, Hedayati P, Isfahani P. The study of avoidable mortality due to road traffic accidents during 2004-2010: a case study in Kerman, Iran. J Manag Inf 2014; 2(1): 26-20
4. Legal Medicine Organization, Statistics of deaths from traffic accidents between, 2010-2012, emerg infect (serial online) from http://www.lmo.ir/pdf, 6 Jun (In Persian)
5. Mobaleghi M, Molanaie N. Deaths from motor vehicle crashes in patients admitted to hospital accident in 2001 in Sanandaj. J Kurdistan Univ Medical Sci 2002; 20(5): 60-65. (In Persian)
6. Zare M, Nouri H. Survey of mortality from traffic accidents in 2001. In the First Congress of the Non-Communicable Disease Prevention, Gilan, Iran; 2002.p. 228. (In Persian)
7. Curry P, Ramaiah R and Vavilala MS. Current trends and update on injury prevention. Int J Crit Illn Inj Sci. 2011 Jan-Jun; 1(1): 57–65.
8. Naghavi M. Mortality in 18 provinces of Iran in 1380. Health Deputy. Ministry of Health and medical Education 2003:171-73. (In Persian)
9. Jamalian M, Eslamdoust M, Rezaei A, Alizadeh S. Investigating the causes of death in the injured of traffic accidents referred to Valiasr hospital in Arak, based on oral autopsy and forensic autopsy. J Arak Uni Med Sci 2020; 23(3): 338-47. (In Persian)
10. Razzaghi A, Soori H, Kavousi A, Abadi A, Khosravi A. Factors with the highest impact on road traffic deaths in Iran; an ecological study. Arch Acad Emerg Med 2019; 7(1): 1-8. (In Persian)
11. Saki M, Saleh A, Gailanimoshfeghi F. Epidemiology of fatal accidents in the province during 1999-2001. J Forensic Con 2001; 28(8): 24-6. (In Persian)
12. Davoodi F, Hashemi- Nazari SS, Ghadirzadeh MR. Epidemiology study of road traffic accidents resulting in death: in Lorestan province in 2012. J Saf Promot Inj Prev 2016; 3(4): 257-62. (In Persian)
13. Monsef Kasmai V, Asadi P, Maleki Ziabari M. The epidemiologic of the traffic accidents helped by EMS, Guilan 2011-2013. Iran J Forensic Med 2014; 20(2): 55-60. (In Persian)
14. Mobaleghi J, Molanae N. Study of death and injuries rate that are because of driving accidents relating to people who were hospitalized in accidents section of Besat hospital of Sanandaj on year 1380. J Kurd Univ Med Sci 2001; 24(6):

[DOI: 10.32592/jorar.2022.14.3.1]

pp: 28-33. (In Persian)
15. Hannan EL, Farrell LS, Mottley L. Motor vehicle crashes in New York State: importance of accounting for emergency department deaths when assessing differences in in-hospital mortality by level of care. J Trauma 2001; 50(6): 1117-24.
16. Rostami K, Zohouri H, Rezaie E. The epidemiology study of mortality death related car accidents. J Ardabil Univ Med Sci 2008; 8(4):381-6. (In Persian)
17. Barzegar A, Sadegh H, Chaboksavar N. Epidemiology of deaths from traffic accidents in Kermanshah Province in 2004. J Kerman Univ Medical Sci 2006; 13(2): 48-48. (In Persian)
18. Spoerri A, Egger M, Von Elm E. Mortality from road traffic accidents in Switzerland: longitudinal and spatial analyses. Accid Anal Prev 2011; 43(1): 40-8.
19. Ghorbani A, Rabiei MB, Chaskazi A. Epidemiology of trauma due to collision in Shahid Motahari hospital of Gonbad E Kavous city. Scie J Forensic Medic 2009; 15(53): 29-34. (In Persian)
20. Road safety. Global Health Observatory. 2013. from: http://www.who.int/gho/road_safety/en/
21. Lin MR, Kraus JF. A review of risk factors and patterns of motorcycle injuries 2009; 41:710-22
22. Charkazi A, Esmaeili A, Garkaz G, Qoreishi Z, Gerey S, Nazari S. Epidemiologic survey of road traffic accidents in patients admitted in emergency department of Alejalil Hospital In Aq-Qala City, Golestan Province . Int J Hyg Environ Health 2012; 3(2): 42-9. (In Persian)
23. Fanian, H, Ghadi Kola, Pasha M, Ghoddousi A, Ghodosi A, Abedi MH, Farajzadegan Z, Kazemi A. Epidemiologic study of deaths in road accidents in the province during 2002-2003. J Legal Med 2007; 2 (13): 87-91. (In Persian)
24. Forouzesh M, Mirhadi SJ, Mohammadi S, Javadi Vasigh H, Asadi Kh. Characteristics of Traffic Accidents in Referrals to Bandar Abbas Forensic Medical Center with Detecting of Fictitious Injuries in the One Year Period from 2016 to 2017. Ir J Forensic Med 2019; 25(4):171-176. (In Persian)
25. Valent F, Schiava F, Savonitti C, Gallo T, Brusaferro S, barbone F. Risk factors for fatal road traffic accidents in udine, Italy. Acid Anal Prev 2002 34 (7): 71-89.
26. Bachani AM, Koradia P, Herbert HK, Mogere S, Akungah D, Nyamari J, et al. Road traffic injuries in Kenya: the health burden and risk factors in two districts. Traffic Inj Prev 2012; 13(1):24-30.
27. Entezami N, Hashemi-Nazari SS, Soori H, Khosravi A, Ghadirzadeh MR. Epidemiology of fatal road traffic accidents in Northern provinces of Iran during 2009 to 2010. J Saf Promot Inj Prev 2015; 3(1): 1-8. (In Persian)

[DOI: 10.32592/jorar.2022.14.3.1]