WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 5.045
Volume 4, Issue 4, 313-323. Research Article ISSN 2277– 7105

PATTERN OF ROAD TRAFFIC ACCIDENT INJURIES IN YOUNG ADULTS

Havagiray R Chitme[1*], Mohammed Al Harbi[1] and Tareq Said Nasser Al Saadi[2]

[1]Oman Medical College, Premedical and Pharmacy Campus, Muscat – Oman.

[2]Department of Clinical Pharmacy, Sur Hospital, Ministry of Health, Sur – Oman.

Article Received on
25 Jan 2015,

Revised on 20 Feb 2015,
Accepted on 16 March 2015

***Correspondence for Author**
Dr. Havagiray R Chitme
Oman Medical College, Premedical and Pharmacy Campus, Muscat – Oman.

ABSTRACT

Continuous increase in number of road traffic accident injuries has become a concern globally. These non-fatal injuries results in increased medical expenditure due to disabilities and huge loss of productive Man-days especially if associated with young adult age group. Impact of these injuries can be estimated based on the type of injuries in this age group population. Therefore, present study was carried out with an objective of determining types of injuries, consequences and hospitalization due to road traffic accidents. Present study was retrospective Cross-sectional, carried out in a secondary care hospital for one year period. A total of 202 accident cases from 20 years up to 40 years of age group were included in the study. Results of present study indicates that most of the accident associated injuries were recorded in the younger population (ages 20 – 24), having the highest rate of multiple body injuries followed by head injury. It is therefore, very crucial to prevent serious injuries specially in young adult age group by active involvement of health professionals and understand the young drivers risky driving behaviours so that appropriate action can be taken up to improve the situation in productive population. We strongly recommend for an awareness campaign especially in schools, colleges, universities, hospitals, health centres, shopping malls and sportive events to emphasize the patterns of road traffic accident in young adults to prevent double loss to the country, society and community in general.

KEYWORDS: Road traffic accident, Road traffic accident injury, Young adult, Injury, Non-fatal injury.

INTRODUCTION

The Global Status Report by WHO predicted that, by 2030, fatalities from road Accidents will rise to the 5th leading cause of death globally and will be doubled in Oman. The WHO report also predicted that road fatalities will be a 3rd leading cause of all death and disability by 2020 in Oman. It also ranked Oman at fourth place in the Arabian Gulf Co-operation council states and 57th worldwide with respect to the occurrence of traffic accidents and resulting injuries and deaths.[1-3] The Oman statistics - 2009 indicates that the road traffic Accidents caused 2.67 accidents per 1000 population or 9.59 accidents per 100 registered vehicles, 34% of total injuries and 16.2% of total deaths.[4] There were 1131 deaths and 11364 injuries in 2012 whereas 1051 deaths and 11322 injuries in 2011.[5] It has been estimated that the total estimated productive years lost due to disabilities from accidents is 4.356 years and the estimated number of productive years lost due to accidents and deaths is 15.22 years.[6]

The overall mean length of stay in hospitals after traffic accidents was 23.5 days ranging from 3.8 days in Jordan to 44.6 days in Sharjah.[7] The duration of hospital stay of patients who sustained spinal injury was the longest. Patients with traffic injuries comprised between 13% and 31% of all injury-related attendees in hospitals; 48% of bed occupancy in surgical wards in some countries; and were the most frequent users of operating theatres and ICUs.[8] Similar results are expected in the Sultanate of Oman as these are neighbouring countries with similar statistics of traffic accidents. Reduction in road traffic accidents would reduce these financial burdens on the patient, family and society in general. It could also improve the productivity of the manpower and betterment of family and society. Injuries caused by motor vehicle accidents in Middle East countries are among the highest in the world. Several successful interventions preventing road traffic injuries in the developed countries have been practiced; however, these interventions have not been tailored to the cultural, behavioral, and environmental conditions. The casualty and fatality rates in Gulf countries has been attributed to the behaviour of vehicle drivers.[9-11] It has been noted that non-fatal severe injury rates are declining, but mild injury rates increased, perhaps because of increased traffic congestion and improved notification. It is also important to note that speed cameras installed to decrease speeding enough affected the death rate, without affecting overall injury rates.[11] According to recent data in 2011 published by Royal Oman Police about 1056 deaths resulted from traffic accidents. [12] Each death is estimated to cost almost 15 years of manpower or more than 15,000 years annually.[6] 11437 injuries are being estimated in 2011 due to 5494

accidents.[5] Each injury is expected to reduce almost 5 years of working manpower.[6] Cumulative effect could be approximately loss of 55,000 working years due to traffic accident injuries. In-patient morbidity in MOH institutions due to external causes in 2011 was 17,527, of which road traffic accidents and injury victims comprised 5760 patients, 3662 of whom were between the ages 1–40 years.[13-14] This indicates that the morbidity due to road traffic accidents is a third of the total number of morbidity due to external causes. 143 deaths of total 202 were recorded as in-patient deaths in MOH institutions, of which 107 due to RTAs were below 40 years. Recent study indicated that road traffic fatalities in Oman may have direct relationship with increased motorization resulted in an increased burden of road traffic fatalities and injuries.[15]

Literature review suggests that, despite increasing awareness of the importance of addressing road safety among stakeholders in Oman, road traffic injuries have not been a research priority with little relevant current evidence from the region to inform policy. Robust epidemiological research that can assess the magnitude and key determinants of road traffic injuries is essential to determine context-specific road safety initiatives that are relevant and affordable. Greater attention to harnessing routinely collected data from hospital information systems to inform policy is also required. Obtaining the data on mortality due to road traffic accident is easy but the data on non-fatal victims suffering from various types of injuries is very difficult to obtain as it depends on number of factors.[16] The non-fatal injuries results in the double loss to the country. Firstly, medical expenditure incurred in the treatment of these victims and secondly being the most productive age group resulting in huge productive man-days loss.[17-18]

Present study was based on the hypothesis that young-adult age group population has different types of non-fatal road accident injuries due to inexperience, psychological immaturity and aggressive behaviour leading to different types of injuries than adult. The primary objective of the study was to determine the types of injuries due to road traffic accidents reported to Sur hospital from January 2014 to December 2014 among young-adult population. Secondary objective of the study was to assess the consequences and hospitalization. Third objective of the study was the comparison of the results of young adult with the age group of above 40 years old.

MATERIAL AND METHODS

Study design

This was a hospital based cross sectional study among drivers between the age group of 20 - 40 years old compared with the age group of above 40 years of age reported due to road traffic accident injury at Sur Hospital, Ministry of Health – Oman a secondary care hospital for the population of South Sharqiya Governorate. The information about the patients admitted as road traffic accident injury cases were obtained from patient's medical record of Out-Patient-Department, Emergency and Trauma Centre of the hospital.

Collection of Data

Data on demography, age, gender, types of injuries, injured organ, and length of hospital stay and outcomes were recorded.

Criteria of inclusion and exclusion

The criteria of inclusion of cases were those who have a road traffic accident injury cases in the age group 20 years to 40 years reported to selected hospital during the study period January 2014 to December 2014. Data of road traffic injuries and its pattern in age group of above 40 years old were used for comparing. Those cases who died in at the scene or en-route to the hospital due to injuries were excluded from the study.

Medical Ethics

Study was conducted after obtaining required permission from the hospital and was informed that the obtained data will be only used for the purpose of education and scientific research. The identity of the participants and findings were treated with highest possible degree of confidentiality and privacy so that no direct personal information such as names or identity numbers was required.

Statistical Analysis

Each case was given a case number and the information collected in this study was entered directly into Microsoft Excel and analyzed by percentage-frequency distribution. Data were summarized to illustrate the categorization and frequency of the injuries and the duration of hospitalization according to age group. Correlation of data was analysed by using Pearson correlation and $P<0.05$ considered to be significant.

RESULT

Age- Wise Categorization of Patients

Fig 1 shows that 77% of the cases reported in one year are due to road traffic accidents in young adult and 33% of them were from age group more than 40 years old. Majority of the patients (53; 34%) of them were from the age group of 20 to 24 years old having a total of 34% of the population while patients who were in the 35 to 40 years old age group were the least in the category having only a total of 16% from the population. A total of 48 cases from above 40 years old were noted. Thus, this is an indication that most accidents happen at young age group. Pearson correlation analysis shows that there is a significant decline in incidence of road traffic accident injuries with age ($p<0.01$, r -0.991).

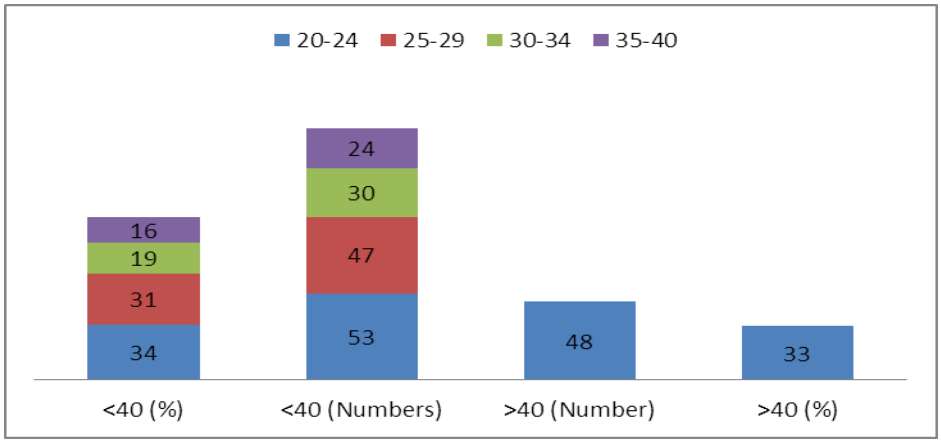

Fig- 1. ***Age- Wise Categorization of Patients***

Gender Wise Comparison between Young Adult and Above 40

Fig 2 shows that male gender have higher rate of road traffic accidents without regard to the age group. In young adults, 84% of accidents were noted in male whereas accidents in female of this age group were comparatively less than adults. Accordingly, male young adults are more prone to have accidents compared with the clients above 40 years old who only have 16% of the total population.

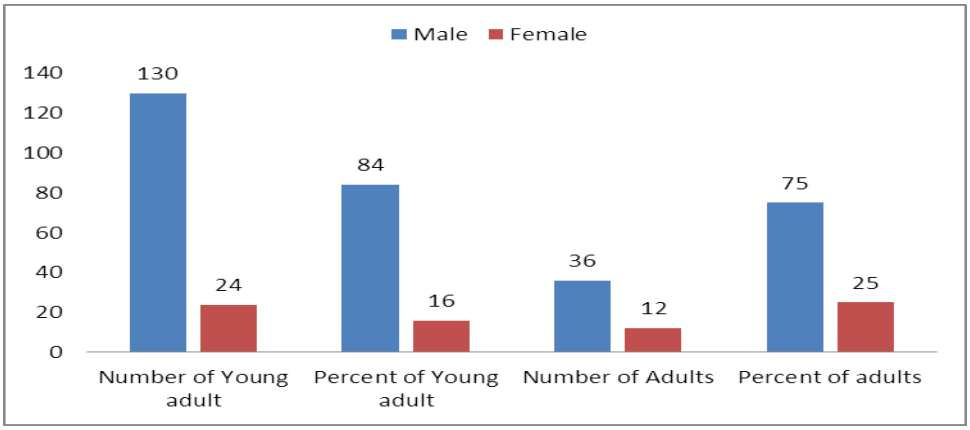

Fig 2. ***Gender Wise Comparison between Young Adult and Above 40***

Duration of Hospitalization

Figure 3 shows the number and percent of patients according to the duration of hospital stay. It was revealed that most of patients under the young adult comparatively have a higher hospitalization duration compared with the age group of above 40 years.

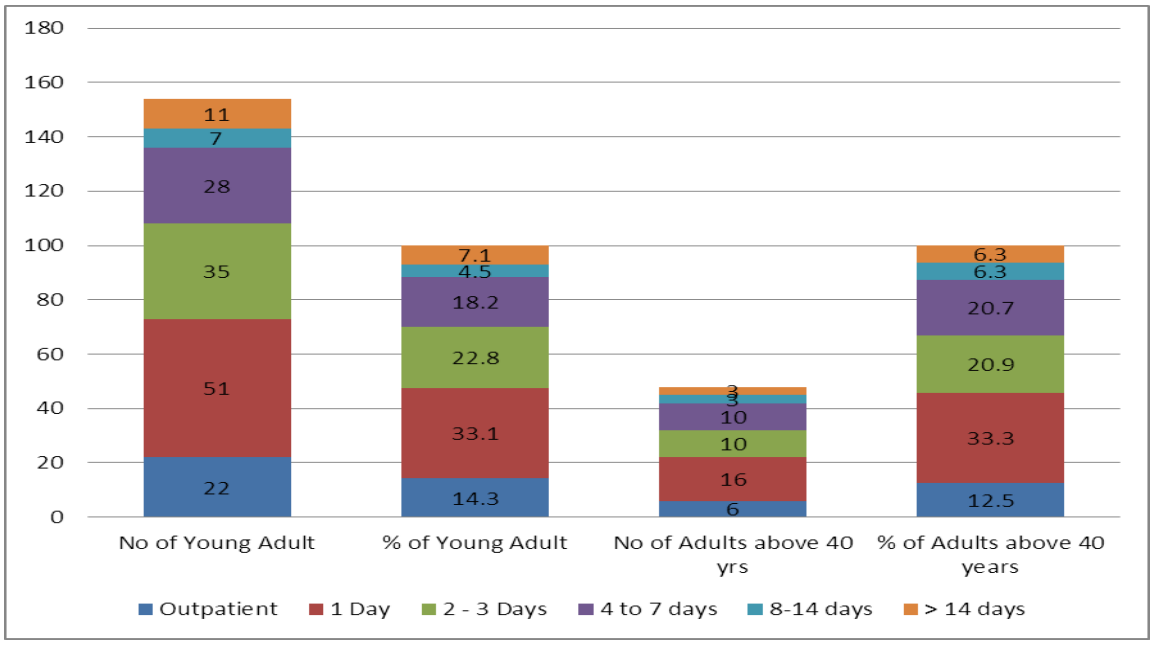

Fig 3. ***Duration of Hospitalization***

Number of Patients According to the Sustained Injury

Table 1 shows that most of the young adults have Significantly ($p<0.05$) higher rate of head, spinal cord and multiple body injuries than adults of more than 40 years. In adults of above 40 years injuries to the extremities and thoracic were significantly ($p<0.05$) more than young adults. Spinal injury was least for higher age group and injuries at the lower extremities for the young age group.

Table 1. ***Number of Patients According to the Sustained Injury***

Body part	Total for Young Adult		Total for Above 40 years		Total %
	% of Cases	Number of cases	% of Cases	Number of cases	
Head	22.1	34	14.6	7	20.29
Thoracic	16.9	26	18.7	9	17.32
Spinal	13	20	2.1	1	10.39
Upper Extremities	10.3	16	16.7	8	11.88
Lower Extremities	9.9	15	20.8	10	12.37
Multiple Body Injuries	27.8	43	27.1	13	27.72

Age wise Categorization of Injuries in Young Adult Patients

Table 2 and Figure 4 shows that young adult in the age group of 20-24 have sustained major injuries in head and upper extremities compared to other age groups. In age group 25-29 higher number of injuries were observed in thoracic, spinal, lower extremities and multiple body injuries. However, equal number of injuries in thoracic and multiple body injuries were recorded in other age groups. There was a significant ($P<0.05$) Negative correlation observed with head and upper extremities with aging.

Table 2. Age wise Categorization of Injuries in Young Adult Patients

AGE	TYPE OF INJURY					
	HEAD	THORACIC	SPINAL	UPPER EXTREMITIES	LOWER EXTREMITIES	MULTIPLE BODY INJURY
20 – 24	20	6	4	8	4	10
25 – 29	10	8	8	4	8	17
30 – 34	2	5	6	2	2	9
35 – 40	2	7	2	2	1	7
TOTAL (Young Adult)	**34**	**26**	**20**	**16**	**15**	**43**

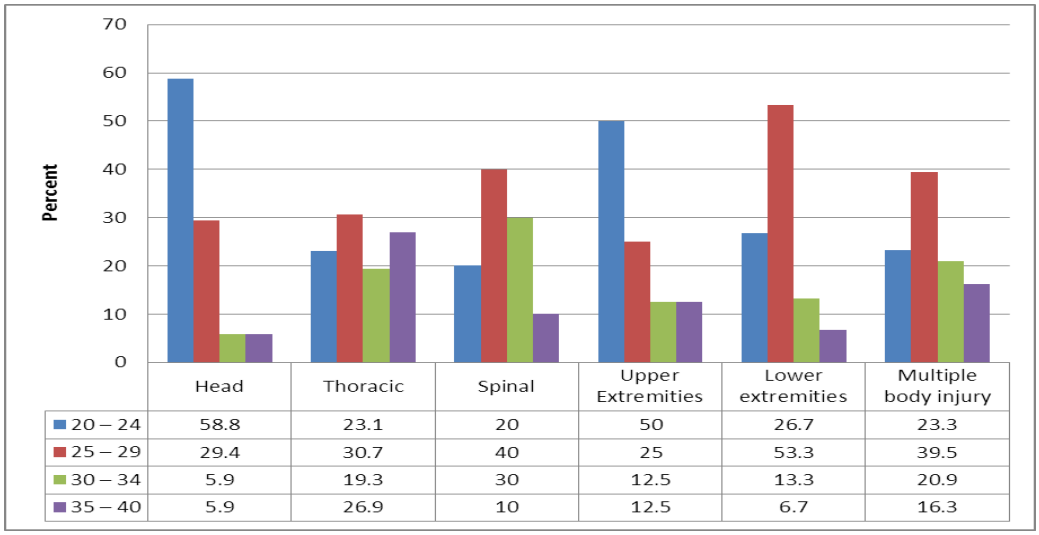

Fig 4. Percentage of Organ Specific Injuries in Young Adults

DISCUSSION

Morbidity and mortality due to Road traffic accident is a serious public health issue in most parts of the world including the GCC countries. Despite increasing awareness of the importance of addressing road safety conducted by various agencies including Royal Oman Police, road traffic injuries have steadily and significantly increasing. However, research in this field is not on priority and few studies published in this field are with little reliable and reproducible data. Therefore, present study was carried out with an objective to assess the

type of road traffic accident injuries and there severity in secondary care hospital to determine context-specific road safety initiatives that are relevant and preventable. Present study was a cross sectional systematic retrospective study. Medical records available at hospital were reviewed and we calculated types of non-fatal injuries with respect to age, gender and hospitalisation. Results of our study indicate that young adult male population have 84% rates of road traffic accidents. These results are similar to the results obtained in Nigerian study of 83.6%[19] but lesser than Iran where it was 91.83%.[20]

In our study, average age of road traffic accident injuries was 27.5 years in younger the age 20-40 years selected in this study. Higher number of accident injuries i.e. 34% in 20-24 and 31% of them were noted in 25-29 age groups aggregating to 65% of cases. These results are similar to the results published from Iran.[21-22] It can be attributed to negligence, inattention, inexperience and risky behavior.[20] The study from UAE ascribed majorly to driving behavior followed by awareness, education and training, infrastructure, vehicle, law enforcement, coordination and quality of resources.[23]

Detailed analysis of various injuries in the body of patients visited hospital due to road traffic accident injuries revealed that out of 202 patients, highest number of injuries were multiple body injuries counting 27.72% contributed equally by both young adult age group and the group above 40 years. It was also observed that 20.29% of patients have sustained head injury of which 22.1% were in the young adult which was higher than 14.6% seen in above 40 years age group. Total spinal injuries were observed in 10.39% of cases which was majorly 13% contributed by young adult age group and only 2.1% by the age group above 40 years. Thoracic injuries, upper extremity and lower extremity injuries were higher in above 40 years age group than young adult. Analysis of age group and organ specific injury shows that head, and upper extremities injuries were highest in 20-24 age group cases. Whereas, thoracic, spinal, lower extremity, and multiple body part injuries were highest in 25-29 age group patients. These results are in line with previous study where majority of injuries were recorded in 18-24 years age group drivers with 69% of head injuries.[21] Injuries sustained in head are known to cause cranial and mid-facial fractures and intracranial bleeding.[24] CT scans of head injury have also shown seizures, skull fractures, persistent headache, lesions, intra-cerebral haemorrhage, brain contusion, paranasal sinus, cerebral oedema, subdural haematoma and epidural haematoma.[19] Therefore, special and urgent attention should be paid at the reduction of head injury to prevent future life- long consequences. Frequency of body part injuries recorded in our study are in line with that studies conducted earlier which

found head and neck injuries due to head-on collisions.[25] It could also be due to impact of driver against dashboard and steering wheel.[26] Total orthopedic fractures including spinal, upper extremities, lower extremities and thoracic observed in this study are on higher side. Management of these Injuries cost higher, suffers longer, impair sexual life, impact everyday life of the family and occupational life.[27-28]

A cross-sectional study estimated the burden of road traffic injured patients and the length of stay in hospital based on the discharge records of primary and secondary level hospitals. In which, approximately 19% of the hospitals were occupied by patients injured in a road traffic accident and the average duration of hospital stay was 5-7 days.[29] In our study the duration of hospitalization was 2-3 days however most of them were only for one day and very less to be admitted above 3 days. In this case, those who were admitted above 3 days have more serious body injuries and same goes with the above 40 years age group. Irrespective of severity of injury the victim will have chronic pain, negative physical, psychological, social, environmental impairment with posttraumatic stress disorder.[30]

We conclude from this study that, young age group population has the highest rate of serious injuries which may have double effect on the society. It is therefore, very crucial to train them for safe driving, understand their risky driving behaviours, and take appropriate action to improve the situation in Oman. We strongly recommend for an awareness and campaign at schools, colleges, universities, hospitals, health centres and shopping malls to emphasize the patterns of road traffic accident especially for the young adults in Oman. Implementing strict driving license policy specially in the ages 20-24 years may also help reduce the road traffic accident cases in the country.

REFERENCES

1. World Health Organization. Global status report on road safety: Time for action, Department of Violence & Injury Prevention & Disability. World Health Organization, Geneva, Switzerland, 2009. www.sho.int/violence_injury_prevention_safety/2009.
2. World Health Organization. Road traffic injuries, Fact sheet N°358, March 2013, Geneva.
3. Mazharul MI and Al Hadhrami YS. Increased Motorization and Road Traffic Accidents in Oman, Journal of Emerging Trends in Economics and Management Sciences, 2012; 3(6): 907-914.
4. Royal Oman Police. Accident rate higher than world's average, Oman Daily Observer, Sunday, 28th August 2011.

5. Nair R, The long arm of the law, The Week, Feb 2013; 519: 3-4.
6. World Health Organization. Preventing road traffic injury: a public health perspective for Europe. Copenhagen: WHO Regional Office for Europe, 2004.
7. Chalya PL, Mabula JB, Dass RM, Mblenge N, Nyayomela IH. Injury characteristic and outcome of road traffic crash victims at Bugundo Medical Centre in North western Tanzania. J. Trauma Man. Out., 2012; 6: 1.
8. Odero W, Garner P, Zwi A. Road traffic injuries in developing countries: a comprehensive review of epidemiological studies. Tropical Medicine and International Health, 1997; 2: 445–460.
9. El-Sadig M, Norman JN, Lloyd OI, Romilly P, and Bener A. Road traffic accidents in the United Arab Emirates: trends of mobidity and mortality during 1977-1978. Accident Analysis and Prevention, 2002; 34: 465-476.
10. Burgut HR, Bener A, Sidahmed H, Albuz R, Sanya R, Khan WA. Risk factors contributing to road traffic Accidents in a fast-developing country: the neglected health problem. Ulus Travma Acil Cerrahi Derg, 2010; 16(6): 497-502.
11. Mamtarani R, Al-Thani AA, Sheikh JI, Lowenfels AB. Motor vehicle injuries in Qatar: time trends in a rapidly developing Middle Eastern nation. Inj Prev. 2012; 18(2): 130-2.
12. Times of Oman Supplement, Road safety. A special supplement with Times of Oman, 2013.
13. Ministry of Health (MOH). Annual Health Report 2011, Muscat (Oman): Ministry of Health Chapter 8 and 9.
14. Ministry of National Economy (MoNE). Statistical year book, 2010, issue 38, Number 2010. Muscat (Oman): MoNE. www. Mone.gov.om.
15. Al-Reesi H, Ganguly SS, Al-Adawi S, Laflamme L, Hasselberg M, Al-Maniri A. Economic growth, motorization, and road traffic injuries in the Sultanate of Oman, 1985-2009. Traffic Inj Prev, 2013; 14(3): 322-8.
16. Fitzharris M, Dandona R, Anil Kumar G, and Dandona L. Crash characteristics and patterns of injury among hospitalized motorized two-wheeled vehicle users in urban India. BMC Public Health, 2009; 9: 11.
17. Miller TR, Romano ED, Spicer RS. The cost of childhood unintentional injuries and the value of prevention. Future Child, 2000; 10: 137-163.
18. Spicer R, Miller T, Langley J and Stephenson S. Comparison of injury case fatality rates in the United States and New Zealand. Injury Prevention, 2005; 11: 71-76.

19. Eze KC, Mazeli FO. Computed tomography of patients with head trauma following road traffic accident in Benin City, Nigeria. West Afr J Med, 2011; 30(6): 404-7.
20. Moafian G, Aghabeigi MR, Heydari ST, Hoseinzadeh A, Lankarani KB, Sarikhani Y. An epidemiologic survey of road traffic accidents in Iran: analysis of driver-related factors. Chin J Traumatol, 2013; 16(3): 140-4.
21. Mohammadi G. Road traffic crash injuries and fatalities in the city of Kerman, Iran. Int J Inj Contr Saf Promot, 2013; 20(2): 184-91.
22. Zangooei DH, Shafahi Y, Zangooei DM. Fatal accident distribution by age, gender and head injury, and death probability at accident scene in Mashhad, Iran, 2006-2009. Int J Inj Contr Saf Promot, 2013; 20(2): 121-33.
23. Hassan MN, Hawas YE, Maraqa MA. A holistic approach for assessing traffic safety in the United Arab Emirates. Accid Anal Prev. 2012; 45: 554-64.
24. Abiodun A, Atinuke A, Yvonne O. Computerized tomography assessment of cranial and mid-facial fractures in patients following road traffic accident in South-West Nigeria. Ann Afr Med, 2012; 11(3): 131-8.
25. Madubueze CC, Chukwu CO, Omoke NI, Oyakhilome OP, Ozo C. Road traffic injuries as seen in a Nigerian teaching hospital. Int Orthop, 2011; 35(5): 743-6.
26. Parkinson F, Kent S, Aldous C, Oosthuizen G, Clarke DL. Patterns of injury seen in road crash victims in a South African trauma centre. S Afr J Surg, 2013; 22; 51(4): 131-4.
27. Hours M, Chossegros L, Charnay P, Tardy H, Nhac-Vu HT, Boisson D, Luauté J, Laumon B. Outcomes one year after a road accident: Results from the ESPARR cohort. Accid Anal Prev, 2013; 50: 92-102.
28. Pan RH, Chang NT, Chu D, Hsu KF, Hsu YN, Hsu JC, Tseng LY, Yang NP. Epidemiology of orthopedic fractures and other injuries among inpatients admitted due to traffic accidents: a 10-year nationwide survey in Taiwan. Sci World J. 2014; 5: 637872. doi: 10.1155/2014/637872. eCollection 2014.
29. Mashreky SR, Rahman A, Khan TF, Faruque M, Svanström L, Rahman F. Hospital burden of road traffic injury: major concern in primary and secondary level hospitals in Bangladesh. Public Health, 2010; 124(4): 185-9.
30. Nhac-Vu HT, Hours M, Chossegros L, Charnay P, Tardy H, Martin JL, Mazaux JM, Laumon B. Prognosis of outcome in adult survivors of road accidents in France: one-year follow-Up in the ESPARR cohort. Traffic Inj Prev, 2014; 15(2): 138-47.