EPIDEMIOLOGY OF TRAUMA VICTIMS SERVED BY PRE-HOSPITAL SERVICE

Epidemiologia das vítimas de trauma atendidas por serviço pré-hospitalar

Epidemiología de las víctimas de trauma atendidas por servicio pre-hospitalario

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ABSTRACT

Objective: to characterize the epidemiological aspects of the victims of trauma treated by a Mobile Emergency Care Service 192. **Method:** an exploratory, descriptive and quantitative study, carried out in the first aid hospital of a reference hospital. The target population was the victims of trauma treated by the Mobile Emergency Care Service, transported to the referred hospital. **Results:** It was observed that 5.9% were admitted to the emergency due to Firearm Injuries, 4.9% to White Weapon Injury, 23.8% to fall, and 60.4% due to traffic accidents. **Conclusion:** the identified profile was of men, victims of traffic accident, in the ages of 18 to 35 years, with full second degree, being the thorax the most affected region. This study may support the development of strategies to deal with these diseases, since the large number of deaths from external causes are considered a public health problem, causing irreparable sequelae.
DESCRIPTORS: External causes; Multiple trauma; Emergency relief; Nursing.

RESUMO

Objetivo: caracterizar os aspectos epidemiológicos das vítimas de trauma atendidas por um Serviço de Atendimento Móvel de Urgência 192. **Método:** estudo exploratório, descritivo e quantitativo, realizado no pronto socorro de um hospital de referência. A população alvo foram as vítimas de trauma atendidas pelo Serviço de Atendimento Móvel de Urgência, transportadas para o referido hospital. **Resultados:** observou-seque 5,9% deram entrada na urgência por Ferimentos por Arma de Fogo, 4,9% por Ferimento por Arma Branca, 23,8% por queda, e 60,4% por acidentes de trânsito. **Conclusão:** o perfil identificado foi de homens, vítimas de acidente de trânsito, nas idades de 18 a 35 anos, com segundo grau completo, sendo o tórax a região mais atingida. Esse estudo pode subsidiar a elaboração de

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estratégias para enfrentamento desses agravos, pois a grande quantidade de óbitos por causas externas são considerados um problema de saúde pública, causando sequelas irreparáveis.

DESCRITORES: Causas externas; Traumatismo múltiplo; Socorro de urgência; Enfermagem.

RESUMEN

Objetivo: caracterizar los aspectos epidemiológicos de las víctimas de trauma atendidas por un Servicio de Atención Móvil de Urgencia 192. **Método:** estudio exploratorio, descriptivo y cuantitativo, realizado en el pronto socorro de un hospital de referencia. La población objetivo fueron las víctimas de trauma atendidas por el Servicio de Atención Móvil de Urgencia, transportadas al referido hospital. **Resultados:** se observó que el 5,9% ingresó en la urgencia por Feridas por Arma de Fuego, 4,9% por Lesión por Arma Blanca, 23,8% por caída, y 60,4% por accidentes de tránsito. **Conclusión:** el perfil identificado fue de hombres, víctimas de accidente de tránsito, en las edades de 18 a 35 años, con segundo grado completo, siendo el tórax la región más afectada. Este estudio puede subsidiar la elaboración de estrategias para enfrentar esos agravios, pues la gran cantidad de muertes por causas externas son consideradas un problema de salud pública, causando secuelas irreparables.

DESCRIPTORES: Causas externas; Traumatismo múltiplo; Socorro de urgencia; Enfermería

INTRODUCTION

Trauma is defined as a harmful event that results from the release of specific forms of energy or physical barriers produced by action outside the body causing injuries characterized by structural changes or physiological imbalances.[1] They are health hazards, intentional or not, of sudden onset and as an immediate consequence of violence or other exogenous cause.[2]

Traumas constitute a major public health problem in Brazil and worldwide, leading to various social and economic consequences for the population. They are responsible for high health expenditures and have a significant impact on population morbidity and mortality, causing permanent injury and sequelae.[2-3]

The International Statistical Classification of Diseases and Related Health Problems, in its 10th Revision (ICD-10), includes as external causes injuries caused by transport events, homicides, aggressions, falls, drowning, poisonings, suicides, burns, injuries from landslides or floods, and other occurrences caused by environmental circumstances: mechanical, chemical, thermal, electrical energy and / or radiation.[3]

External causes are considered leading causes of mortality and morbidity in the last four decades, resulting in more than 5 billion deaths worldwide, with accidents and homicides as major causes of this increase.[4] Studies estimate that 70% of the general population will go through some traumatic event during their life time.[5-6]

According to the Brazilian Mortality Information System (SIM), in 2016, 155,861 deaths from external causes were recorded. In the same period, in the state of Rio Grande do Norte (RN), 3,180 deaths were recorded, with the highest rates in the metropolitan region, where 1,528 deaths were recorded in the same period.[7]

American Trauma Committee estimated that by 2020 one in ten people will die from trauma. In April 2018, the Ministry of Health pointed out that hospitalizations in northeastern Brazil due to external causes were 25,306. In Rio Grande do Norte, in the same period, there were 1,549 hospitalizations.[7]

To provide early assistance to the victims of these injuries, Brazilian Ministry of Health implemented, in 2003, Mobile Emergency Care Service (SAMU), by Ordinance n.1863 / GM under the National Emergency Care Policy. The objective was to reduce the number of deaths and injuries, as well as the length of hospital stay resulting from trauma, thus enabling early assistance.[6,8]

External causes are considered an emerging public health problem in Brazil and, especially, in the state of RN, due to high mortality rates and hospitalizations, mostly of victims of traffic accidents, violence and other traumatic causes. As a result, victims are losing their life potential, leaving their families helpless and often without future prospects.

The analysis of the data from this research may serve as a basis for (re) formulating health policies and creating more operative and effective prevention strategies, as well as supporting planning, management and evaluation processes of health care policies related to morbidity and mortality due to external causes. Therefore, this study aims to describe epidemiological characteristics of trauma victims treated by a Mobile Emergency Care Service 192.

METHODS

This is an exploratory, descriptive and quantitative study of data collected in the emergency room of a referral hospital for urgent care in the state of Rio Grande do Norte (RN). The target population were the patients treated by SAMU 192 RN, victims of trauma, after being rescued, stabilized and transported to the referred hospital.

This study is a clipping of a larger project developed with a convenience sample of 384 users. From this universe, all individuals whose care was motivated by trauma were selected, thus, the sample of the present study consisted of 206 users.

Inclusion criteria for participation in this research were: users who had suffered a traumatic event, were 18 years of age or older, were conscious or had a legally responsible companion in the case of hemodynamic instability or awareness. Victims in clinical situations were excluded.

Data was collected between January and June of 2016, through the application of a previously established instrument composed of questions that addressed the sociodemographic and clinical characteristics of the interviewees. The questionnaire was applied after patients entering the emergency room were stabilized or were already hospitalized. Next, the purpose of the research was addressed and explained, as well as the benefits and risks that the participation of the research could entail. At this point the Informed Consent Form (ICF)was made available.

The instrument included the following variables: sociodemographic data (age, gender, education level, income and occupation), type of injury suffered and the type of vehicle that transported the victim - Basic Support Unit (USB), Advanced Support Unit (USA), Rescue Unit (UR) and helicopter. Then the data was entered and distributed into categories in a static program (SPSS), which enabled building tables and charts. The analysis was performed through descriptive statistics.

This study complies with all ethical aspects governed by Resolution No. 466 of December 12, 2012, of the National Health Council, which defines standards for research involving human beings. Taking into consideration the resolution, the proposal was submitted for analysis by the Research Ethics Committee of the Onofre Lopes University Hospital (HUOL), Natal / RN, obtaining a favorable opinion, under protocol 437/2010 and CAAE: 0025.0.294.051-10, on July y 9, 2010.

RESULTS

During the study period, SAMU 192 RN attended to 206 occurrences of traumatic nature. In order to characterize the victims of trauma treated by SAMU 192 RN, some variables were chosen that made it possible to trace the epidemiological profile: gender, age, education level, occupation, most affected body region and treatment.

Regarding the characteristics of trauma, it was observed that 124 (60.4%) were admitted to the emergency room due to car accidents, 49 (23.8%) due to fall from their own height, 11 (5.4%) were due to fractures resulting from sports and recreational injuries, 12 (5.9%) were admitted for Firearm Injury (FAF) and 10 (4.9%) for White Gun Injury (FAB). Of 206 patients admitted to the emergency room for External causes 155 (75.2%) were male and 51 (24.8%) female as shown in Table 1.

Table 1 - Characterization of trauma victims treated by SAMU 192 RN, in terms of gender and type of traumatic event, Natal, Brazil, 2017

Variables	FAF[ϖ] n (%)	FAB n (%)	QPA[Ω] n (%)	FLER[∞] n (%)	AT[*] n (%)	Total n (%)
Sex						
Male	10 (4,9)	8 (3,9)	29 (14,1)	8 (3,9)	100 (48,7)	155 (75,2)
Female	2 (1,0)	2 (1,0)	20 (9,7)	3 (1,5)	24 (11,7)	51 (24,8)
Age range						
18 to 35 years old	8 (3,9)	6 (2,9)	6 (2,9)	3 (1,5)	81 (39,4)	104 (50,6)
36 to 67 years old	4 (1,9)	3 (1,5)	19 (9,2)	5 (2,4)	38 (18,5)	69 (41,6)
68 to 101 years old	0 (0,0)	1 (0,5)	24 (11,7)	3 (1,5)	5 (2,5)	33 (16,2)
Schooling						
Illiterate	0 (0,0)	1 (0,5)	10 (4,9)	3 (1,5)	3 (1,5)	17 (8,4)
Elementary School	1 (0,5)	3 (1,5)	16 (5,3)	2 (1,0)	15 (9,2)	36 (17,5)
High school	1 (0,5)	4 (2,0)	8 (3,9)	1 (0,5)	59 (28,7)	73 (35,6)
Higher education	1 (0,5)	0 (0,0)	3 (1,5)	0 (0,0)	4 (2,0)	11 (4,0)
Occupation						
Field worker	2 (1,0)	0 (0,0)	0 (0,0)	1 (0,5)	11 (5,4)	13 (6,9)
Unemployed	0 (0,0)	1 (0,5)	2 (1,0)	0 (0,0)	6 (3,0)	9 (4,5)
Construction	1 (0,5)	3 (1,5)	4 (2,0)	0 (0,0)	11 (5,9)	19 (9,9)
Commerce and other services	5 (2,7)	10 (5,0)	2 (1,0)	2 (1,0)	45 (22)	64 (31,7)
Liberal professional	0 (0,0)	1 (0,5)	0 (0,0)	0 (0,0)	6 (3,0)	7 (3,5)
Freelancer	1(0,5)	0 (0,0)	2 (1,0)	1 (0,5)	12 (6,0)	16 (8,0)
From home or retired	0 (0,0)	2 (1,0)	27 (13,1)	4 (2,0)	11 (5,4)	44 (21,5)

Firearm Injury (FAF) π, White Weapon Injury (FAB) Ψ, Fall from Own Height (QPA) Ω, Sports and Recreational Injury Fractures (FLER) ∞, and Traffic Accidents (AT) *.

According to the total number of occurrences, 104 (50.6%) were between 18 and 35 years old and 73 (35.6%) graduated high school. 44 (21.5%) were housewives or retirees and 64 (31.7%) were engaged in commerce and other services. The most affected body region was the thorax, abdomen and pelvis representing 49.2% (Table 2).

Table 2 - Characterization of trauma victims treated by SAMU 192 RN, according to the most affected body region, Natal, Brazil, 2017

Variables	Body part affected					
	FAF π	FAB	QPA Ω	FLER ∞	AT *	Total
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Head and face	4 (2,0)	1 (0,5)	6 (3,0)	1 (0,5)	18 (8,1)	30 (14,1)
Thorax, abdomen, pelvis	3 (1,5)	3(1,5)	32 (14,5)	7 (3,2)	63 (28,5)	108 (49,2)
Extremities	3 (1,5)	4(2,0)	5 (2,5)	1 (0,5)	37 (17,0)	50 (23,5)

Firearm Injury (FAF) π, White Weapon Injury (FAB) Ψ, Fall from Own Height (QPA) Ω, Sports and Recreational Injury Fractures (FLER) ∞and Traffic Accidents (AT) *.

Table 3 presents the time of day when trauma occurred with 117 cases (53%) occuring during the day, 53 (24%) occurrences in the early hours, and the night time as the lowest incidence, with 33 (15.5%).

Table 3 - Characterization of trauma victims treated by SAMU 192 RN, by the time of occurrence, Natal, Brazil, 2017

Variables	Timing of the occurence					
	FAF π	FAB	QPA Ω	FLER ∞	AT *	Total
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Day	6 (3,0)	3 (1,5)	32 (14,4)	3 (1,5)	73 (33,1)	117 (53,0)
Night	6 (3,0)	1 (0,5)	4, (2,0)	1 (0,5)	21 (9,5)	33 (15,5)
Early morning	0 (0,0)	6 (3,0)	11 (5,0)	3 (1,5)	33 (15)	53 (24,5)

Firearm Injury (FAF) π, White Weapon Injury (FAB) Ψ, Fall from Own Height (QPA) Ω, Sports and Recreational Injury Fractures (FLER) ∞and Traffic Accidents (AT) *.

Table 4 shows the day of the week when trauma occurred, with the highest occurrence on Fridays, with 37 (18.5%), followed by Sundays with 30 (15.5%), while Wednesdays are the days of the week with the lowest number of occurrences - 19 (9.5%).

Table 4 - Characterization of trauma victims treated by SAMU 192 RN, according to the day of the week, Natal, Brazil, 2017

Variables	Day of the week					
	FAF π	FAB	QPA Ω	FLER ∞	AT *	Total
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Sunday	1 (0,5)	1 (0,5)	5 (2,5)	2 (1,0)	21 (10,5)	30 (15,5)
Monday	0 (0,0)	3 (1,5)	5 (2,5)	1 (0,5)	20 (10,0)	29 (14,5)
Tuesday	2 (1,0)	0 (0,0)	7 (3,5)	4 (2,0)	16 (8,0)	29 (14,5)
Wednesday	3 (1,5)	1 (0,5)	5 (2,5)	0 (0,0)	10 (5,0)	19 (9,5)
Thursday	2 (1,0)	0 (0,0)	14 (7,0)	0 (0,0)	12 (6,0)	28 (14,0)
Friday	2 (1,0)	1 (0,5)	8 (4,0)	1 (0,5)	25 (12,5)	37 (18,5)
Saturday	2 (1,0)	4 (2,0)	1 (0,5)	1 (0,5)	20 (10,0)	28 (14,0)

Firearm Injury (FAF) π, White Weapon Injury (FAB) Ψ, Fall from Own Height (QPA) Ω, Sports and Recreational Injury Fractures (FLER) ∞and Traffic Accidents (AT) *.

DISCUSSION

In this descriptive analysis, traffic accidents represent the highest incidence of injuries due to external causes, with males as the most affected group. A study conducted in the state of Pernambuco, northeastern region of Brazil, presented similar data, identifying the prevalence of male gender among the emergency room patients treated due to external causes (87.8%). Collision accidents were responsible for the majority of patients, predominantly young workers of low professional qualification.[9]

Comparing current data with a study conducted in South Korea, considered a first-world country, a significant reduction in traffic accidents by 21.3% was detected in recent years, which may mean that the occurrence of these injuries is still a challenge for developing countries like Brazil.[10]

A study carried out in Mozambique revealed that the most affected by trauma were the students, with age ranging from 20 to 29 years. In the same study, traffic accidents were identified as the main cause of trauma, with pedestrian-car accidents predominating and more prevalent in men than in women.[11]

Another survey conducted in Kashan, Iran, in 2014, corroborates the data from this study when it shows that males were more involved in trauma occurrences. This same study described that young people aged 16 to 30 make up 43.8% of the occurrences, followed by victims aged 31 to 45.[12] Other studies also confirm the higher prevalence of traumas among men than women, since men are more vulnerable and exposed to these events, due to more violent practices, faster driving and abuse of alcohol and other drugs.[6,13]

Investigations indicate that trauma is one of the priority lines of care in Brazil, so the Ministry of Health has been developing measures to improve the effectiveness and quality of notifications in emergency services, claiming that epidemiological analyzes, supported by research of this nature act as an epidemiological surveillance tool, revealing more characteristics about the victims and coping strategies.[6,14]

The second cause of trauma was fall, directly related to the elderly population, with 11.7% of cases. According to the Brazilian Institute of Statistical Geography (IBGE), the age pyramid in Brazil has shown significant changes in recent years due to population aging and decreasing fertility.[6,15] These groups at the top of the pyramid need greater medical attention due to high morbidity and mortality related to the trauma.[3]

In São Paulo, a study indicated that the most frequent accidents in the elderly were falls (31.3%), with head / neck injuries corresponding to 59.5% of all injuries suffered by the elderly.[16] In Victoria, Australia, surveys conducted among the elderly also pointed out this type of occurrence as the most common, especially in those over 85 years old.[17]

In the states of Mato Grosso and Rio Grande do Sul, Brazil, the analysis identifies the fall from his/her own height as the largest cause of trauma in the elderly (28.3%). Given these findings, a health education program for the elderly, family members and caregivers, is worth implementing along with a better adaptation of physical spaces frequented by the elderly public. The authors also reinforce that one should intervene to reduce modifiable intrinsic risk factors.[18-19]

Regarding other types of trauma in the elderly, a study conducted in Rasht, Iran, demonstrated that among the traffic accidents suffered by this population, the most frequent type was being run over (40.5%), representing, together with motorcyclists, the highest mortality rate in the studied region.[20]

According to data collected in the present study, body areas most affected by trauma were thorax, abdomen and pelvis. The areas coincide with the high number of traffic accidents, a relationship supported by the analysis of trauma biomechanics / kinematics. However, research conducted at a trauma center in Switzerland revealed the head as the most affected body region, differing from the findings of this research.[21] In the study in southern Tehran, lower and upper limbs were reported as the most affected by trauma,[22] corroborating the findings in Cuiabá / MT, Brazil, where these body regions were the most affected as well.[23]

In Iran, between 2010 and 2015, researchers identified that head and neck area was considered the hardest hit, mainly due to car accidents.[24] In northern Jordan, for both sexes, the head was the most common area to suffer traumatic injury, followed by the abdomen, back and pelvis. The same study demonstrated that running over pedestrians were the most common traffic accidents, with children and adolescents being the largest group of victims, affecting the head and neck in the vast majority of cases.[25]

Regarding the timing of trauma, this research demonstrated day-time as the time when most accidents occur (53.5%), followed by the dawn (24.5%). Research shows that late afternoon and early evening periods show a large number of vehicles circulating due to the end of working hours when most people are on their way home. Therefore majority of trauma incidents occur during those time-frames.[6] The factors related to the number of accidents at night include impaired vision limited by range of headlights, use of dark clothing by pedestrians, unmarked vehicles, speeding, disregard for signaling, and use of alcohol and/or other drugs.[25]

Regarding the days of the week with the most traumatic events, the weekend stands out (Friday, Saturday and Sunday). In the study conducted in Pernambuco, most traumatic occurrences occurred on Monday, possibly related to the increased concentration of work activities during the week.[9]

However, a survey conducted by an emergency mobile prehospital service in the state of Rio Grande do Norte in 2014 found that most of the visits occurred on the weekend (53.9% of the occurrences) and, to a lesser extent, Wednesday (10.5%).[25] Analysis indicates that the highest proportion of external causes during the weekend is related to festive situations and driving under influence.[3-26]

CONCLUSIONS

The identified profile was of men, victims of traffic accidents, aged 18 to 35 years old who completed high school and the most affected body region was the thorax.

Descriptive, categorical and quantitative study of epidemiological aspects of trauma victims can support the elaboration of strategies to cope with these injuries, because a large number of deaths from external causes are considered a public health problem, causing irreparable sequelae.

In addition, it will serve as a subsidy for the creation and evaluation of public policies for prevention, health promotion and action planning, especially in the search for improvements in assistance in emergency mobile prehospital services, as the first hours are crucial for polytrauma patients. This research can serve as a tool to aid the management of resources in public urgent care services, as well as development of new alternatives for their improvement.

This study has limitations as it was restricted to only one Brazilian state, however state and local epidemiological data are close to the reality of the entire country. Therefore, suggest replicating research of this nature in the other states of the federation.

REFERENCES

1. Ong YS, Levin LS. Lower limb salvage in trauma. Plast Reconstr Surg [internet] 2010; 125(2): 582-8 [cited 2018 Sept 28]. Available from: https://insights.ovid.com/pubmed?pmid=20124844

2. Silveira ES, O'Dwyer G. Centro de trauma: modela alternativo de atendimento às causas externas no estado do Rio de Janeiro. Rev Saúde Debate [internet] 2017; 41(112) [Accessed em 06 June, 2018]. https://www.scielosp.org/pdf/sdeb/2017.v41n112/243-254/pt

3. Gomes ATLG, Silva MF, Dantas BAS, Dantas RAN, Mendonça AEO, Torres GV. Perfil epidemiológico das emergências traumáticas assistidas por um serviço pré-hospitalar móvel de urgência. Enferm Glob [internet] 2017; 45(2) [Accessed on 14 July , 2017]. http://scielo.isciii.es/pdf/eg/v16n45/pt_1695-6141-eg-16-45-00384.pdf

4. World Health Organization. Injuries and violence: the facts 2014 [internet]. Geneva: WHO; 2014 [cited 2018 Sept 28]. Available from: https://apps.who.int/iris/handle/10665/149798

5. Benjet C,Bromet E, Karam EG, kessler RC, Mclaughlin KA, Ruscio AM, et al. The epidemiology of traumatic event exposure worldwide: results from the World Mental Health Survey Consortium. Psycholmed [internet] 2016; 46(2) [cited 20 June 2017]. Available from: https://www.ncbi.nlm.nih.gov/pubmed/26511595

6. Dias JMC, Lima MSM, Dantas RAN, Costa IKF, Leite JEL, Dantas DV. Perfil de atendimento do serviço pré-hospitalar móvel de urgência estadual. Cogitare Enferm [internet]2016; 21(1) [Accessed on 04 June, 2017]. http://revistas.ufpr.br/cogitare/article/view/42470/27511

7. Tecnologia da Informação a Serviço do SUS [Internet] Brasília: DATASUS; 2018 [Accessed on 08 June, 2018]. http://www2.datasus.gov.br/DATASUS/index.php?area=02

8. Dantas RAN, Torres GV, Salvetti MG, Dantas DV, Mendonça AEO. Instrumento para avaliação da qualidade da assistência pré-hospitalar móvel de urgência: validação de conteúdo. Rev Esc Enferm USP [internet] 2015; 49(3) [Accessed on05 July 2017]. http://www.scielo.br/pdf/reeusp/v49n3/pt_0080-6234-reeusp-49-03-0381.pdf

9. Souto CC, Reis FKW, Bertolini RPT, Lins RSMA, Souza SLB. Perfil das vítimas de acidentes de transporte terrestre relacionados ao trabalho em unidades de saúde sentinelas de Pernambuco, 2012 - 2014. Epidemiol serv saúde [internet] 2016; 25(2) [Accessed on 09 June, 2018]. http://www.scielo.br/pdf/ress/v25n2/2237-9622-ress-25-02-00351.pdf

10. Park JM. Outcomes of the support services for the establishment of regional level 1 trauma centers. J Korean Med Sci [internet] 2016; 59(12) [cited 20 Apr 2017]. Available from: https://www.researchgate.net/publication/312034270_Outcomes_of_the_support_services_for_the_establishment_of_regional_level_1_trauma_centers

11. Taibo CLA, Moon TD, Joaquim OA, Machado CR, Merchant A, McQueen K, et al. Analysis of trauma admission data at an urban hospital in Maputo, Mozambique. Int J Emerg Med [internet] 2016; 9(6) [cited 10 June 2018]. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4760964/

12. Adib-Hajbaghery M, Maghaminejad F. Epidemiology of Patients With Multiple Trauma and the Quality of Their Prehospital Respiration Management in Kashan, Iran: Six Months Assessment. Arch Trauma Res [internet] 2014; 3(2) [cited 28 Sept 2018]. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4139695/

13. Baratloo A, Shokravi M, Safari S, Aziz AK. Predictive Value of Glasgow Coma Score and Full Outline of Unresponsiveness Score on the Outcome of Multiple Trauma Patients. Arch Iran Med [internet] 2016; 19(3) [cited 20 Sept 2018]. Available from: https://www.ncbi.nlm.nih.gov/pubmed/26923895

14. Albuquerque NMG, Cavalcante CAA, Macêdo MLAF, Oliveira JSA, Medeiros SM. Causas externas: características de crianças e adolescentes assistidas em um hospital do Rio Grande do Norte. Rev Bras saúde [internet] 2014; 16(2) [Accessed on 20 May, 2017]. http://periodicos.ufes.br/RBPS/article/viewFile/9297/6471

15. Sarmento SDG, Dantas RAN, Dantas DV, Oliveira SP, Henriques LMN, Costa IB. Perfil das vítimas de afecções neurológicas atendidas por um serviço pré-hospitalar móvel de urgência. Cogitare Enferm [internet] 2017; 22(2) [Accessed on 20 May, 2017]. http://revistas.ufpr.br/cogitare/article/view/49698/pdf

16. Degani GC, Júnior GAP, Rodrigues RAP, Luchesi BM, Marques S. Idosos vítimas de trauma: doenças preexistentes, medicamentos em uso no domicílio e índices de trauma. Rev Bras Enferm [internet] 2014; 65(5) [Accessed on 05 June, 2018]. http://www.scielo.br/pdf/reben/v67n5/0034-7167-reben-67-05-0759.pdf

17. Coxa S, Roggenkampa R, Bernarda S, Smitha K. The epidemiology of elderly falls attended by emergency medical services in Victoria, Australia. Injury Int J Care Injured [internet] 2018; 49(1) [cited 28 Sept 2018]. Available from: https://www-sciencedirect.ez18.periodicos.capes.gov.br/science/article/pii/S0020138318303498

18. Nascimento JS, Tavares DMS. Prevalência e fatores associados a quedas em idosos. Texto & contexto enferm [internet] 2015; 25(2) [Accessed on 04 June, 2017]. http://www.scielo.br/pdf/tce/v25n2/0104-0707-tce-25-02-0360015.pdf

19. Rosa TSM, Moraes AB, Peripolli A, Filha AVSF. Perfil epidemiológico de idosos que foram a óbito por queda no Rio Grande do Sul. Rev Bras Geriatr Gerontol [internet] 2015; 18(1) [Accessed on 05 June, 2017]. http://www.scielo.br/pdf/rbgg/v18n1/1809-9823-rbgg-18-01-00059.pdf

20. Etehad H, Yousefzadeh-Chabok SH, Davoudi-Kiakalaye A, Moghadam Dehnadi A, Hemati H, Mohtasham-Amiri Z. Impact of road traffic accidents on the elderly. Arch Gerontol Geriatr [internet] 2015; 61(3) [cited 13 June 2018]. Available from: https://www.sciencedirect.com/science/article/pii/S0167494315300406?via%3Dihub

21. Heim C, Bosisio F, Roth A, Bloch J, Borens O, Daniel R T, et al. Is trauma in Switzerland any different? Epidemiology and patterns of injury in major trauma – a 5-year review from a Swiss trauma centre. Swiss med wkly [internet] 2014; 144(13) [cited 20 June 2017]. Available from: https://smw.ch/article/doi/smw.2014.13958

22. Ziaeirad M, Alimohammadi N, Irajpour A, Aminmansour B. Association between Outcome of Severe Traumatic Brain Injury and Demographic, Clinical, Injury-related Variables of Patients. Iran J Nurs Midwifery Res [internet] 2018; 23 [cited 11 June 2018]. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5954643/

23. Silva HPS, Galvão ND, Muraro AP. Perfil epidemiológico das vítimas dos acidentes de transporte, atendidos na rede viva no município de Cuiabá-MT, 2011. Tempus [internet] 2016; 10(1) [Accessed on 10 June 2018]. http://www.tempusactas.unb.br/index.php/tempus/article/view/160

24. Abbasi H, Bolandparvaz S, Yadollahi M, Anvar M, Farahgol Z. Time distribution of injury-related in-hospital mortality in a trauma referral center in South of Iran 2010-2015. Medicine [Internet] 2017; 96(21) [cited 04 July 2017]. Available from: https://www.ncbi.nlm.nih.gov/pubmed/28538377

25. Alzghoul MM, Shakhatreh MK, Alsheyab N. Unintentional Injuries and Violence among Adults in Northern. Int. j. environ. Res Public Health [internet] 2017; 14(341) [cited 04 July 2017]. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5409544/

26. Seyboth MP, Assada VK, Danielli VR. Delineamento do perfil epidemiológico dos atendimentos do serviço de atendimento móvel de urgência (SAMU) Maringá-PR. Rev Uningá [internet] 2016; 48 [Accessed on 14 June 2018]. http://revista.uninga.br/index.php/uninga/article/view/1285/905

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