



## ORIGINALES

### Traffic accident: a review of cases of head trauma

Acidente de trânsito: análise dos casos de traumatismo cranioencefálico

Accidente de tráfico: análisis de los casos de traumatismo cranioencefálico

Cristiane da Silva Ramos Marinho<sup>1</sup>

Jokasta Nicolay de Araújo Santos<sup>1</sup>

Luiz Alves Morais Filho<sup>1</sup>

Cecília Nogueira Valença<sup>1</sup>

Emelyne Gabrielly de Oliveira Santos<sup>1</sup>

Oswaldo de Góes Bay Júnior<sup>1</sup>

<sup>1</sup> Universidade Federal do Rio Grande do Norte/ Faculdade de Ciências da Saúde do Trairi (UFRN/FACISA). Brazil. [cristiane\\_amos@hotmail.com](mailto:cristiane_amos@hotmail.com)

<http://dx.doi.org/10.6018/eglobal.18.2.324751>

Received: 15/03/2018

Accepted: 2/06/2018

### ABSTRACT:

**Objective:** The objective of this study was to characterize the victims of traffic accidents hospitalized in a general hospital in the city of Natal and the traffic accident suffered by them.

**Methods:** This is an exploratory, cross-sectional, quantitative, descriptive study conducted with 90 victims of traffic accidents, from July to November 2015, who had Cranioencephalic Trauma.

**Results:** 90% of the victims studied were male, 28.9% were between 20-29 years of age, 43.3% of the accidents were on Sunday, the motorcycle was the most involved vehicle (83.3%). Victims were 74.4% motorcycle drivers, 26.7% were wearing helmets and 65.6% had drunk alcoholic beverages. The motorcycle crashes represented 48.9% of the accidents. Mild Cranioencephalic Trauma was highlighted.

**Conclusion:** The profile of the victims of traffic accidents with traumatic brain injury is characterized by males and young people. Already the accident presents predominance at the end of the week, having the bike as its main responsible and the alcohol intake contributed to the event.

**Key words:** Traffic Accidents; Cranioencephalic Trauma; Nursing

### RESUMO:

**Objetivo:** Caracterizar vítimas de acidente de trânsito internados em um hospital geral da cidade do Natal e o acidente de trânsito sofrido por eles.

**Métodos:** Trata-se de uma pesquisa exploratória, transversal, com abordagem quantitativa, de caráter descritivo, realizada com 90 vítimas de acidente de trânsito, de julho a novembro de 2015, que tiveram Traumatismo Cranioencefálico.

**Resultados:** Foram encontrados 90% das vítimas estudadas pertenciam ao sexo masculino, 28,9% na faixa etária de 20-29 anos, 43,3% dos acidentes foram no domingo, o veículo mais envolvido foi moto (83,3%), entre as vítimas 74,4% eram condutores de moto, 26,7% fazia uso de capacete e 65,6% havia feito uso de bebida alcoólica. A queda de moto representou 50% dos acidentes. Destacou-se o Traumatismo Cranioencefálico leve.

**Conclusão:** O perfil das vítimas de acidentes de trânsito com traumatismo craneoencefálico caracteriza-se por indivíduos do sexo masculino e jovens. Já o acidente apresenta predomínio no final de semana, tendo a moto como o seu maior responsável e a ingestão de álcool contribuído para o evento.

**Palavras-chave:** Acidentes de trânsito; Traumatismos encefálicos; Enfermagem.

## RESUMEN:

**Objetivo:** Caracterizar a los pacientes víctimas de accidentes de tráfico internados en un hospital general de la ciudad de Natal y el accidente de tráfico sufrido por ellos.

**Métodos:** Estudio exploratorio, descriptivo, transversal, retrospectivo, con abordaje cuantitativo, realizado con 90 víctimas de accidentes de tráfico, en el periodo de julio a noviembre de 2015, que tuvieron Traumatismo Craneoencefálico.

**Resultados:** El 28,3% de las víctimas estudiadas pertenecían al sexo masculino, el 28,9% en el grupo de edad de 20-29 años, el 43,3% de los accidentes fueron en domingo, el vehículo más involucrado fue moto (83,3%), el 74,4% eran conductores de moto, el 26,7% hacía uso de casco y el 65,6% había bebido alcohol. La caída de moto representó el 50% de los accidentes. Se destacó el Traumatismo Craneoencefálico leve.

**Conclusión:** El perfil de las víctimas de accidentes de tráfico con traumatismo craneoencefálico se caracteriza por individuos varones y jóvenes. El accidente presenta predominio el fin de semana, teniendo la moto como su mayor responsable y la ingestión de alcohol contribuye al evento.

**Palabras clave:** Accidentes de tráfico; Traumatismos encefálicos; Enfermería.

## INTRODUCTION

Traffic accidents (TA) today constitute a major public health problem in Brazil and worldwide, being considered important morbidity and mortality factors <sup>(1)</sup>. Studies show that, among the various factors associated with this cause, stand out poor road signaling, poor roadway illumination, inexperienced drivers, high speed driving, alcoholic beverages consumption, traffic recklessness and the use of mobile phones while driving stand out.

The traumatic brain injury (TBI), in turn, is the main trauma caused by TA's and can be defined as any event involving lesions on the scalp, skull or brain, leading to conditions from mild concussion to coma and death <sup>(4)</sup>. Statistics already point to a large number of victims, especially in ages ranging between 1-44 years, and especially affecting males, being an important cause of morbidity, disability and mortality <sup>(5)</sup>.

In Brazil 39,543 deaths were recorded due to transportation accidents in 2015. Meanwhile, the state of Rio Grande do Norte had significant growth in that data (76.91%) between 1996 and 2015, with 9,917 deaths recorded in the period. In the same period, males presented a higher prevalence of cases, with 84.21% <sup>(6)</sup>.

TBIs are classified as mild, moderate or severe, with the aid of the Glasgow Coma Scale (GCS). The application of this scale, along with the realization of a computed tomography scan (CT), should be part of the first evaluation performed on the patient victim of TBI <sup>(7)</sup>. Primary care is fundamentally important for the good prognosis of a TBI victim, in which the physician, together with a multiprofessional team, through clinical and neurological examination, identifies the severity of the trauma and initiates the necessary care promptly to stabilize the patient <sup>(8)</sup>.

In the Rio Grande do Norte, epidemiological information about the profile of patients with traumatic brain injury is scarce, and its importance for planning preventive actions and for improving the care of these patients <sup>(9)</sup>, this study aimed to characterize the

victims of traffic accidents and the traffic accident suffered by the hospitalized patients in a general hospital in Natal. As we believe it is of utmost necessity to study this theme in order to enable the development of public policies that will minimize the occurrence of these events.

## METHODS

This is a cross-sectional, descriptive study with a quantitative approach performed with 90 traffic accidents victims who had TBI, from July to November 2015. The sample was calculated for convenience.

The study was carried out in a general hospital in the city of Natal, Rio Grande do Norte, Brazil, considered as a state reference in emergency care by the Single Health System, being the main public hospital in the metropolitan region of Natal, which attends burn injuries, orthopedics, neurology and neurosurgery.

Inclusion criteria to collect data was: victims of traffic accidents, with TBI, aged 18 years or over, under observation or admitted to the hospital, who had annotations in their medical records regarding GCS at the time of admission and, in case of coma or impossibility of verbal communication, had a companion.

Data was collected through a proper instrument, with open and closed questions, divided into two sections: personal patient identification and accident data. The victims' medical records were consulted in order to obtain complementary information, such as GCS at the time of admission. Through Excel, the obtained data was electronically categorized and processed. Using the results, descriptive reviews of the study variables in relative and absolute frequency were made.

The ethics and research committee of Trairi's College of Health Sciences approved the research, with CAAE 44894115.5.0000.5568 and protocol 1,116,408. All study participants signed the Written Informed Consent Form (WICF).

## RESULTS

Out of the 90 researched victims of traffic accidents who had TBI, there was a predominance of males (90%), aging from 20 to 29 years (28.9%), with incomplete primary education (45.6%), according to Table 1.

**Table 1- Distribution of traffic accidents victims with TBI according to sex, age group and educational level, Natal / RN, 2015.**

<b>Sex</b>	<b>N</b>	<b>%</b>
Male	81	90
Female	9	10
<b>Age Group</b>	<b>N</b>	<b>%</b>
< 20 years	12	13,3
20 to 29 years	26	28,9
30 to 39 years	19	21,1
40 to 49 years	18	20,0

50 to 59 years	10	11,1
60 or older	5	5,6
<b>Education Level</b>	<b>N</b>	<b>%</b>
Non-literate	11	12,2
Incomplete elementary school	41	45,6
Complete elementary school	14	15,6
Incomplete secondary school	12	13,3
Complete secondary school	10	11,1
Complete higher education	1	1,1
Incomplete higher education	1	1,1

Source: Field research, 2015.

The most common marital status among victims was single, representing 75.6% of the total. Regarding occupation, 16.7% of the interviewed reported being unemployed or farmworkers (16.7%). Analyzing income, most (60%) made from 1 to 2 minimum wages, according to Table 2.

**Table 2 – Traffic accident victims with TBI distribution by occupation and income, Natal/RN, 2015.**

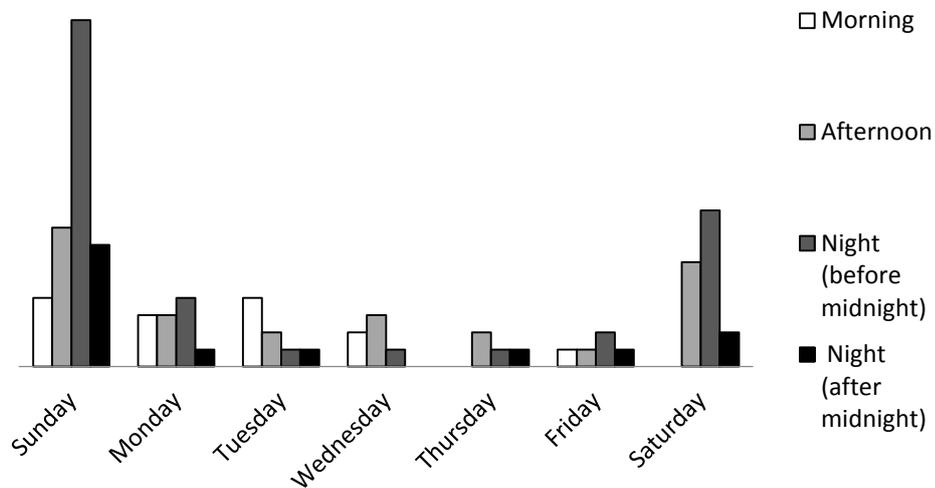
<b>Marital Status</b>	<b>N</b>	<b>%</b>
Single	68	75,6
Married	17	18,9
Divorced	3	3,3
Widowed	2	2,2
<b>Occupation</b>	<b>N</b>	<b>%</b>
Farmer	15	16,7
Unemployed	15	16,7
Pedreiro	6	6,7
Student	5	5,6
Other	41	54,3
<b>Income</b>	<b>N</b>	<b>%</b>
> 1 minimum wage	30	33,3
1 to 2 minimum wages	54	60,0
2 to 5 minimum wages	2	2,2
5 to 10 minimum wages	1	1,1
Did not know	3	3,3
Total	90	100,0

Source: Field research, 2015.

The day of the week with the highest number of accidents was Sunday (43.3%). The shift that had the largest number of events was the night (41.1%) according to Graph 1.

**Graph 1 - Distribution of traffic accidents with victims of TBI by day of the week and shift, Natal / RN, 2015.**

**Gráfico 1**

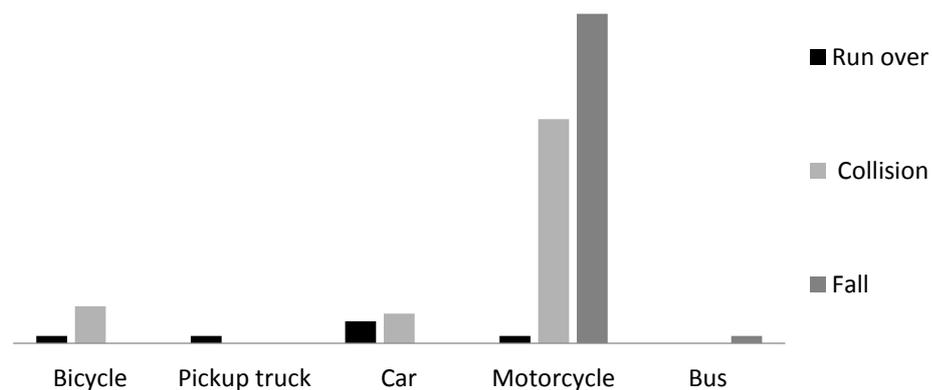


Source: field research, 2015.

The most involved vehicle was motorcycle (83.3%). The type of accident that occurred most was motorcycle fall (50%), followed by motorcycle – car, motorcycle – motorcycle, motorcycle – bike, bike – car, motorcycle – bus collisions (43.2%), according to Graph 2.

**Graph 2 – Traffic accident victims with TBI distribution by type of vehicle and type of accident, Natal/RN, 2015.**

**Gráfico 2**



Source: field research, 2015.

The victims were mostly motorcycle drivers (74.4%), followed by motorcycle passengers (8.9%), cyclists (7.8%), car passengers (1.1%), car drivers (1.1%) and bus passengers (1.1%). Out of the motorcycle occupants, only 26.7% reported wearing a helmet. In relation to alcohol / illicit drugs, 65.6% of the respondents reported use, with alcohol predominating in 64.4% of cases, followed by illicit drugs (1.1%).

Regarding the type of transportation of the victim to the hospital, the Emergency Treatment Mobile Service (SAMU, Serviço de Atendimento Móvel de Urgência) was responsible for 45.6% of the transports, countryside towns hospital ambulances for 44.4% and relatives for 10%.

Observing the trauma severity, most TBIs were mild (68.9%), followed by moderate (14.4%) and severe (14.4%), and CT was performed in 97.8% of the victims.

## DISCUSSION

It was observed a particularization in the profile of traffic accidents victims that had TBI, pointing out for unmarried men whose age group is between 20 and 29 years, motorcycle drivers, who in most cases did not wear a helmet and made use of alcohol, were traveling at night and on weekends. Regarding the severity of TBI, those of a mild degree were highlighted.

The results found in this study were consistent with those of other studies<sup>(10,11)</sup> in which there was a predominance of males, in the age group of young adults, mainly from 20 to 29 years. Most traffic accidents victims are young men, and this fact is due to this group's behavior of exposure to risk of casualties, social context and lifestyle. The age's immaturity, search for strong emotions, desire to overcome challenges, pleasure they feel in situations of risk and irresponsibility in the consumption of alcohol or drugs can contribute to the greater occurrence of traffic accidents with this group<sup>(12,13)</sup>.

As for schooling, the predominance of victims with incomplete elementary school education corroborating another study<sup>(14)</sup>, where 37.47% of the 371 victims studied also had incomplete elementary education. It is noticeable that even with advances in education access policies, basic and higher; many people have not yet completed their studies. Knowing the victim's education level is relevant to the delivery of care, as according to the patient's knowledge degree, the health professional knows what kind of language should be used to allow a good understanding of the information that needs to be collected or clarified.

The single status was prevalent among the victims interviewed in our study, as it has also been found in other studies<sup>(10,15)</sup>. The higher incidence of bachelors is because these people are more susceptible to risk factors for traffic accidents than married people, which can be verified with data found in the literature and in our research<sup>(2)</sup>. In addition, singles usually expose themselves more often to public environments at night, becoming susceptible to alcohol and drug use, as well as driving faster. Married couples usually, over time, tend to decrease their nocturnal social lives, getting more in a residential or working environment, resulting in less exposure to TA.

Regarding the occupation and income of the victims, there was a considerable amount of unemployed, as well as with victims whose occupation was farmworkers. As for

income, the majority of the victims had income between 1 and 2 minimum wages. These results bring some concern, as depending on the severity of the trauma caused by accidents, victims may find it difficult to pay for expenses after hospital treatment, as well as having access to necessary health services, if residing in rural areas or countryside. Depending on the TBI severity, they may have difficulty exercising their work activities, thereby reducing the financial contribution to their families.

This study found that accidents occur more frequently on weekends, especially Sunday, corroborating the findings of other studies<sup>(9,11)</sup>. Some believe that this may be associated with the fact that on weekends people are not exercising their daily duties, enabling a greater participation in festive and leisure events, being the consumption of alcoholic beverages and drug use interconnected to those, consequently causing traffic-accidents.

Most accidents occurred during the night shift, corroborating with data from another study<sup>(1)</sup>. Low visibility due to poor lighting is considered one of the main causes for this. Beyond that, there is also increased sleepiness and loss of attention in carrying out activities at night in relation to the daytime.

The most involved vehicle in this study's victims accidents was the motorcycle, which is also proven by other studies<sup>(3,10,16)</sup>. As for the type of accident, the motorcycle fall was stressed by the study. The instability caused by the type of vehicle most frequently involved in accidents is believed to be the reasoning behind those accidents, as it only has two wheels and due to its ability to reach higher speeds as a self-propelling vehicle, resulting in a lack of safety for the occupants of said transportation.

Among the surveyed victims, there was a higher incidence of motorcycle drivers, of whom the majority were not using helmets. That behavior contributes to the occurrence of Traumatic Brain Injuries, as if the driver does not wear a helmet, the main motorcycle protection equipment, they are more likely to hit directly their heads during a traffic accident, supporting the extreme relevance of helmet usage<sup>(5)</sup>.

Most of the victims had consumed some drug, mainly alcohol, evidence which is consistent with other studies<sup>(1,9)</sup>. Driving after the consumption of alcoholic beverages is a risk factor for the occurrence of traffic accidents, especially when associated with speeding<sup>(2)</sup>.

Concerning the victims transportation to the hospital, it was found in our study that SAMU was responsible for most of the cases. This fact can be explained by SAMU's growth in pre-hospital care, as well as the reliability that this service provides the population with. In Rio Grande do Norte alone, SAMU has 24 decentralized bases that serve 52 cities and approximately two million people, reaching 75% of the state population, which proves the data found in the study<sup>(17)</sup>.

Regarding the TBI severity, most victims presented mild TBI and two did not have the severity of the TBI identified, because they were sedated, being evaluated by the Ramsay scale. Morgado and Rossi<sup>7</sup> also found data similar to this one, where mild TBI was the most prevalent, being present in 82.4% of the cases. This TBI classification by using GCS is fundamental for the treatment and recovery of the victims, as it not only helps the work of the health professionals, but also contributes to the expectations of the patient and family, facilitating the overcoming of sequels and lived incapacities<sup>(7,18)</sup>.

Thus, with the end of the research, it was clear that the victims of traffic accidents are predominantly male, young, with incomplete education, single, have brown skin, farmers and with income of 1 to 2 minimum wages. As for the accident, the most involved vehicle was the motorcycle, the victims were mostly motorcycle drivers who did not wear a helmet and had drunk alcohol. Still concerning the victims, their transport to the hospital was predominantly made by SAMU. It highlighted the mild TBI.

Finally, it is of utmost importance to note that the results of this research are an important source of information for health surveillance, to come to contribute with the creation of public policies, educational movements and supervision to reduce the incidence of traffic accidents.

## REFERENCES

1. Abreu AMM, Lima JMB, Matos LN, Pillon SC. Uso de álcool em vítimas de acidentes de trânsito: estudo do nível de alcoolemia. Rev. Latino-Am. Enfermagem [periódico na Internet]. 2010 [acesso em: 29 dez 2017] ;18:513-20. Disponível em: [http://www.scielo.br/scielo.php?script=sci\\_arttext&pid=S0104-11692010000700005](http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0104-11692010000700005).
2. Almeida RLF, Filho JGB, Braga JU, Magalhães FB, Macedo MCM, Silva KA. Via, homem e veículo: fatores de risco associados à gravidade dos acidentes de trânsito. Rev Saúde Pública [periódico na internet]. 2013 [acesso em: 29 out 2017];47(4):718-31 Disponível em: <http://www.scielo.br/pdf/rsp/v47n4/0034-8910-rsp-47-04-0718.pdf>
3. Marín-león L, Belon AP, Barros MBA, Almeida SDM, Restitutti MC. Tendência dos acidentes de trânsito em Campinas, São Paulo, Brasil: importância crescente dos motociclistas. Cad. Saúde Pública [periódico da Internet]. 2012 [acesso em: 04 fev 2018];28(1):39-51. Disponível em: [http://www.scielo.br/scielo.php?script=sci\\_arttext&pid=S0102-311X2012000100005](http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0102-311X2012000100005).
4. Smeltzer SC, Bare BG, Hinkle JL, Cheever KH. Brunner&Suddarth, Tratado de Enfermagem Médico-Cirúrgico. 12ª ed. Rio de Janeiro (RJ): Guanabara Koogan; 2014.
5. Gaudêncio TG, Leão GM. A Epidemiologia do Traumatismo Crânio- Encefálico: Um Levantamento Bibliográfico no Brasil. RevNeurocienc [periódico da Internet]. 2013 [acesso em: 29 out 2017];21(3):427-34. Disponível em: <http://www.revistaneurociencias.com.br/edicoes/2013/RN2103/revisao/814revisao.pdf>.
- 6 BRASIL. Departamento de Informática do SUS. Óbitos por causas externas. /. 2018 [acessado 2018 mar 15]. Disponível em: <http://datasus.saude.gov.br>
7. Morgado FL, Rossi LA. Correlação entre a escala de coma de Glasgow e os achados de imagem de tomografia computadorizada em pacientes vítimas de traumatismo cranioencefálico. Radiol Bras [periódico na internet]. 2011 [acesso em: 15 mar 2018]; 44(1):35- 41. Disponível em: <http://www.revistaneurociencias.com.br/edicoes/2013/RN2101/original2101/786original.pdf>
8. Gentile JKA, Himuro HS, Rojas SSO, Veiga VC, Amaya LEC, Carvalho JC. Condutas no paciente com trauma cranioencefálico. RevBrasClin Med [periódico na internet]. 2011[acesso em: 29 out 2017]; 9(1):74-82. Disponível em: <http://files.bvs.br/upload/S/1679-1010/2011/v9n1/a1730.pdf>
9. Moura JC, Rangel BLR, Creôncio SCE, Pernambuco JRB. Perfil clínico-epidemiológico de traumatismo cranioencefálico do Hospital de Urgências e Traumas no município de Petrolina, estado de Pernambuco. Arq Bras Neurocir [periódico na

- internet]. 2011 [access: 15 nov 2017; 30(3):99-104. Disponível em: <http://files.bvs.br/upload/S/0103-5355/2011/v30n3/a2709.pdf>.
10. Trevisol DJ, Rohm RL, Vinholes DB. Perfil epidemiológico dos pacientes vítimas de acidentes de trânsito atendidos no serviço de emergência do Hospital Nossa Senhora da Conceição em Tubarão, Santa Catarina. *Scientia Medica* [periódico na Internet]. 2012 [acessado 05 fev 2018];22(3):148-52. Disponível em: <http://revistaseletronicas.pucrs.br/ojs/index.php/scientiamedica/article/viewFile/10823/8185>.
11. Soares RAS, Pereira APJT, Moraes RM, Vianna RPT. Caracterização das vítimas de acidentes de trânsito atendidas pelo Serviço de Atendimento Móvel de Urgência (SAMU) no Município de João Pessoa, Estado da Paraíba, Brasil, em 2010. *Epidemiol. Serv. Saúde*, Brasília [periódico na Internet]. 2012 [acesso em: 05 fev 2018]; 21(4):589-600. Disponível em: [http://scielo.iec.pa.gov.br/scielo.php?script=sci\\_arttext&pid=S1679-49742012000400008](http://scielo.iec.pa.gov.br/scielo.php?script=sci_arttext&pid=S1679-49742012000400008).
12. Eloia SC, Eloia SMC, Sales ENBG, Sousa SMM, Lopes RE. Análise epidemiológica das hospitalizações por trauma cranioencefálico em um hospital de ensino. *Rev SANARE*. [periódico na Internet]. 2011[acesso em: 01 dez 2017]; 10(2): 34-9. Disponível em: <http://sanare.emnuvens.com.br/sanare/article/view/253/226>.
13. Gomes SL, Santos YA, Dourado SBPB, Coêlho DMM, Moura MEB. Perfil das vítimas de acidentes motociclísticos admitidas nas Terapias intensivas de um hospital público. *Rev Enferm UFPE on line*. [periódico na Internet]. 2014 [acessão em: 03 fev 2018]; 8(7): 2004-12. Disponível em: <http://www.revista.ufpe.br/revistaenfermagem/index.php/revista/article/download/4747/9541>.
14. Farias GM, Barros WCTS, Rocha KMM, Freitas MCS, Filho LAM. Caracterização dos condutores de motocicleta vítimas de acidentes de trânsito atendidos em hospital de urgência. *Rev Enferm UFPE on line*. [periódico na Internet]. 2009 [acesso em: 22 fev 2018]; 3(4): 898-907. Disponível em: <http://www.revista.ufpe.br/revistaenfermagem/index.php/revista/article/download/99/2924>.
15. Maia BG, Paula FRP, Cotta GD, Cota MAL, Públio PG, Oliveira H, et al. Perfil Clínico-Epidemiológico das Ocorrências de Traumatismo Cranioencefálico. *RevNeurocienc* [periódico na Internet]. 2013 [acesso em; 19 nov 2017]; 21(1):43-52. Disponível em: <http://www.revistaneurociencias.com.br/edicoes/2013/RN2101/original2101/786original.pdf>
16. Viégas MLC, Pereira ELR, Targino AA, Furtado VG, Rodrigues DB. Traumatismo cranioencefálico em um hospital de referência no estado do Pará, Brasil: prevalência das vítimas quanto a gênero, faixa etária, mecanismos de trauma, e óbito. *ArqBrasNeurocir*. [periódico na internet]. 2013 [acesso em :15 mar 2018]; 32(1):15-18. Disponível em: <http://files.bvs.br/upload/S/0103-5355/2013/v32n1/a3620.pdf>.
17. Rio Grande do Norte. Secretaria da Saúde Pública. SAMU - Serviço de Atendimento Móvel de Urgência [Internet]. Governo do Rio Grande do Norte; 2014. [acessado em: 28 fev 2018]. Disponível em: <http://www.saude.rn.gov.br/Conteudo.asp?TRAN=ITEM&TARG=2370&ACT=null&PAGE=null&PARM=null&LBL=NOT%C3%8DCIA>
18. Settervall CHC, Sousa RMC. Escala de coma de Glasgow e qualidade de vida pós-trauma cranioencefálico. *Acta Paul Enferm*. 2012;[acessado em: 14 mar de 2018]. 25(3):364-70. Disponível em: <http://www.scielo.br/pdf/ape/v25n3/v25n3a08>

ISSN 1695-6141

© [COPYRIGHT](#) Servicio de Publicaciones - Universidad de Murcia