

MEN AND BIKE ACCIDENTS: CHARACTERIZATION OF ACCIDENTS FROM PRE-HOSPITAL CARE

Homens e acidentes de bicicleta: características dos acidentes a partir do atendimento pré-hospitalar

Hombres y los accidentes de bicicletas: caracterización de los accidentes a partir de la atención prehospitalaria

Fabio Lucio Tavares^{1}; Franciéle Marabotti Costa Leite²; Alexandre Barbosa de Oliveira³; Lina Márcia Migueis Berardinelli⁴; Paulete Maria Ambrósio Maciel⁵; Maria José Coelho⁶*

How to quote this article:

Tavares FL, Leite FMC, Oliveira AB, *et al.* Men and bike accidents: characterization of accidents from pre-hospital care. *Rev Fun Care Online*.2021. Jan./Dec.; 13:1402-1407. DOI: <http://dx.doi.org/10.9789/2175-5361.rpcf.v13.9682>

ABSTRACT

Objective: To describe the epidemiological profile of men victims of bicycle accidents. **Method:** descriptive, cross-sectional study with a quantitative approach, carried out in the Mobile Emergency Care Service from the police reports of pre-hospital care, in which the following variables were analyzed: age group, victim quality, trauma mechanisms, type injury, affected body segment, procedures performed in pre-hospital care, type of ambulance and outcome of pre-hospital care. **Results:** 933 records of assistance to men victims of bicycle accidents were analyzed; the majority (29.9%) of the victims were between 18 and 29 years of age, who suffered falls (59%), abrasions (63%), especially affecting the skull and face. **Conclusion:** there is a need to expand studies related to this type of accident in order to support the actions of nurses.

Descriptors: Cycling, Epidemiology, Traffic-accidents, Nursing; Nursing care.

¹ Graduated in Nursing from UFES, PhD in Nursing from the Anna Nery School of Nursing, UFRJ, Professor at UFES.

² Graduated in Nursing from UFES, PhD in Epidemiology from UFPel, Professor at UFES.

³ Graduated in Nursing from the Souza Marques Technical Educational Foundation, PhD in Nursing from the Anna Nery School of Nursing, UFRJ, Professor at UFRJ.

⁴ Graduated in Nursing from the Federal University of the State of Rio de Janeiro, PhD in Nursing from the Anna Nery School of Nursing, UFRJ, Professor of UERJ.

⁵ Graduated in Nursing from the Anna Nery School of Nursing, UFRJ, Professor of UFES.

⁶ Graduated in Nursing from the Anna Nery School of Nursing, UFRJ, Professor of UFRJ.

RESUMO

Objetivo: Descrever o perfil epidemiológico de homens vítimas de acidentes de bicicleta. **Método:** estudo descritivo, transversal, com abordagem quantitativa, realizado no Serviço de Atendimento Móvel de Urgência a partir dos boletins de ocorrência do atendimento pré-hospitalar no qual foram analisadas as seguintes variáveis: faixa etária, qualidade da vítima, mecanismos de trauma, tipo de lesão, segmento do corpo atingido, procedimentos realizados no atendimento pré-hospitalar, tipo de ambulância e desfecho do atendimento pré-hospitalar. **Resultados:** foram analisados 933 registros de atendimentos a homens vítimas de acidentes de bicicleta; a maioria (29,9%) das vítimas tinham entre 18 a 29 anos de idade, que sofreram queda (59%), escoriações (63%), atingindo especialmente o crânio e a face. **Conclusão:** existe a necessidade de ampliar os estudos relacionados com este tipo de acidente com o propósito de subsidiar as ações do enfermeiro.

Descritores: Ciclismo, Epidemiologia, Acidentes de trânsito, Enfermagem, Cuidado de enfermagem.

RESUMEN

Objetivo: Describir el perfil epidemiológico de los hombres víctimas de accidentes de bicicleta. **Método:** estudio descriptivo, transversal, con enfoque cuantitativo, realizado en el Servicio Móvil de Atención de Emergencias a partir de los informes policiales de atención prehospitalaria, en el que se analizaron las siguientes variables: grupo de edad, calidad de la víctima, mecanismos de trauma, tipo lesión, segmento corporal afectado, procedimientos realizados en la atención prehospitalaria, tipo de ambulancia y resultado de la atención prehospitalaria. **Resultados:** se analizaron 933 registros de asistencia a hombres víctimas de accidentes de bicicleta; la mayoría (29,9%) de las víctimas tenían entre 18 y 29 años, que sufrieron caídas (59%), abrasiones (63%), afectando especialmente el cráneo y la cara. **Conclusión:** existe la necesidad de ampliar los estudios relacionados con este tipo de accidentes para apoyar la actuación de los enfermeros.

Descriptores: Ciclismo, Epidemiología, Accidentes de tráfico, Enfermería, Cuidado de enfermera.

INTRODUCTION

Over the decades, nursing care has been undergoing transformations, both in terms of its theoretical and reflective concepts and its daily practice of providing care, seeking to accompany and cope with the difficulties faced by humanity, such as epidemics, natural tragedies, and conflicts between nations.

This scenario has demanded a tireless search by nurses of how to practice in face of the social, economic, and cultural problems of the contemporary world, in order to find ways of caring that take into consideration the human being as an integral being.

In the wake of the challenges faced by nursing, land transportation accidents have been playing an important role in the Brazilian scenario for several decades, as demonstrated by studies¹⁻³ that have been dedicated to this issue. It is estimated that approximately 1.2 million people worldwide lose their lives in traffic accidents every year, and that more than 90% of these deaths occur in low and middle income countries⁴ and especially among men.⁵

In the context of traffic accidents, bicycle accidents have

stood out due to the fact that there are incentives for its use as one of the alternatives for urban transportation.⁶ It is estimated that there is a fleet of approximately 48 million bicycles in Brazil, placing the country in the sixth position of the largest fleet in the world, so that bicycles, together with the pedestrian mode, are the modal responsible for most of the displacements in 90% of the total of Brazilian municipalities.⁷⁻⁸

However, despite the advantages that bicycling brings both in terms of urban mobility and health, since it is an active mode of transportation associated with positive effects on disease prevention, the bicycle infrastructure is not equally accessible in all locations, pointing to the problem of road safety in the use of bicycles, since in many cases they share the same space with cars, posing great risk of accidents.⁹⁻¹⁰

According to the Viva Survey, in 2014, 16,182 cases of transport accidents were recorded in selected urgency and emergency services in 11 Brazilian municipalities, which corresponded to 22.9% of all accident records in that year. Among these accidents, bicycle accidents accounted for 12.4%, ranking second among transportation accidents,¹¹ affecting mostly the male population.

Therefore, this study aims to describe the epidemiological profile of male victims of bicycle accidents. It is expected that this study may contribute to the planning and intervention of nurses, at different levels of health care, in relation to victims of bicycle accidents.

METHODS

This is a descriptive, cross-sectional study with a quantitative approach, conducted at the Central Office of the Mobile Emergency Care Service of Espírito Santo (SAMU-ES), located in the city of Vitória, which is responsible for covering pre-hospital care in Espírito Santo.

We included in the sample all duly completed Pre-hospital Care Occurrence Reports (BOAPH) involving men over 18 years of age, victims of bicycle accidents, attended by the SAMU-ES in the period from January to December 2014. The reports whose care was canceled by Medical Regulation were excluded, as well as those that were incomplete or had illegible handwriting.

Data collection occurred from individualized and manual consultation of the BOAPHs generated by the Basic and Advanced Support Units, and the information was transcribed to a specific instrument for data collection, prepared by the researchers, containing the following variables: age group, quality of victim, trauma mechanisms, type of injury, body segment affected, procedures performed in pre-hospital care, type of ambulance and outcome of pre-hospital care. The data were stored in databases in Microsoft Excel® software and analyzed using STATA® version 12.

The research complied with the criteria of the National

Health Council Resolution 466/2012 and was approved by the Research Ethics Committee of the Anna Nery School of Nursing of the Federal University of Rio de Janeiro, through Opinion no. 1,213,340 of September 3, 2015 - registration of Certificate of Submission for Ethics Appreciation no. 47823515.1.0000.5238.

RESULTS

Between January and December 2014, 43,618 clinical and traumatic emergencies were treated by SAMU-ES. Of this total, 933 calls were due to bicycle accidents, which totaled 2.1% of all calls.

Of the 933 BOAPH, 60 (6.4%) were excluded for not meeting the inclusion criteria of the study. Of the 873 BOAPH that met the inclusion criteria, 486 (55.6%) referred to men over 18 years of age who had suffered bicycle accidents.

As for age group, the study revealed that 118 were between 18 to 29 years old (24.9%), 109 were between 30 to 39 years old (23.0%); 105 were between 40 to 49 years old (22.2%); 82 were between 50 to 59 years old (17.3%), and 60 victims were 60 years old or older (12.7%). Regarding the quality of the victim, 565 were cyclists (96.7%), 15 were pedestrians (3.1%); none were passengers and in one BOAPH (0.2%) this variable was ignored (Table 1).

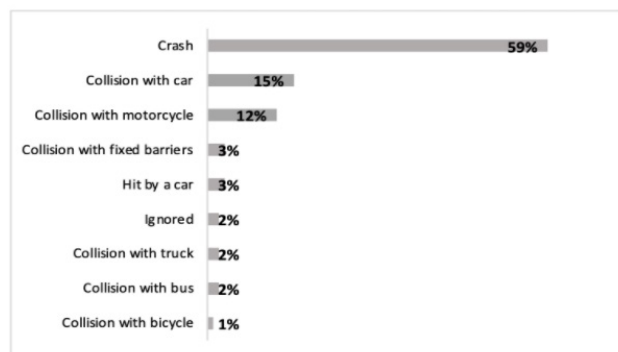
Table 1 - Characterization of care provided to male victims of bicycle accidents. *Vitória, ES, Brazil, 2014.*

Variable	Absolute frequency (n)	Relative frequency (%)
Age Groups		
18 to 29 years old	118	24,9
30 to 39 years old	109	23,0
40 to 49 years old	105	22,2
50 to 59 years old	82	17,3
60 years old or more	60	12,7
Victim Quality		
Cyclist	465	96,7
Passenger	0	0
Pedestrian	15	3,1
Ignored	1	0,2
Procedures performed		
Measuring vital signs	481	18,6
Pulse Oximetry	479	18,5
Immobilization in longboard	466	18
Cervical collar application	453	17,5
Peripheral venipuncture	443	17,1
Compressive dressing	168	6,5
Limb Immobilization	42	1,6
Another	58	2,2
Ambulance type		
Basic Support Unit (USB)	443	92,1
Advanced Support Unit	31	6,4
Ignored	7	1,5
End of care		
Public Hospital	377	78,4
Private Hospital	28	5,8
Not referred to hospital	28	5,8
Another type of outcome	48	10

Source: SAMU-ES, Vitória, 2014.

The trauma mechanisms were 59% falls; followed by 15% car collisions; 12% motorcycle collisions; 3% pedestrian collisions; 3% fixed barrier collisions; 2% bus collisions; 2% bicycle collisions; and in 2% of the occurrences this information was ignored (Figure 1).

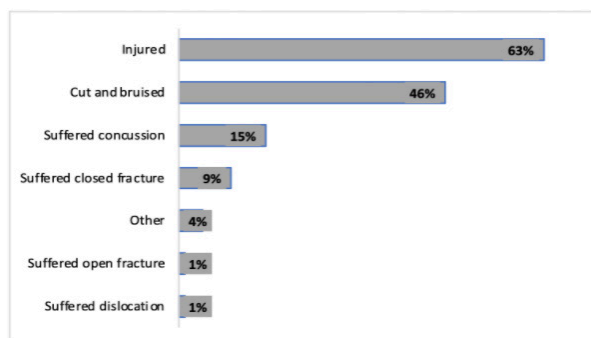
Figure 1 - Characterization of care provided to male victims of bicycle accidents, according to the trauma mechanism. *Vitória, ES, Brazil, 2014.*



Source: SAMU-ES, Vitória, 2014.

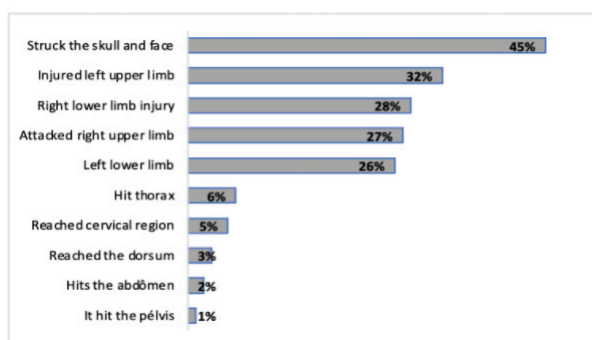
The most common type of injury was excoriation (63%); followed by cut and bruise (46%); concussion (15%); closed fracture (9%); dislocation (1%); and open fracture (1%) (Figure 2).

Figure 2 - Characterization of care provided to male victims of bicycle accidents, according to the type of injury. *Vitória, ES, Brazil, 2014.*



Source: SAMU-ES, Vitória, 2014.

Figure 3 - Characterization of care provided to male victims of bicycle accidents, according to the body segment affected. *Vitória, ES, Brazil, 2014.*



According to the anatomical distribution of injuries, considering the body segment affected, the skull and face region was the most affected (45.3%); followed by the left upper limb (32%); right upper limb (27.2%); right lower limb (27.7%); left lower limb (26.4%); chest (6.4%) and cervical region (5.2%) (Figure 3).

Regarding the procedures performed, presented in Table 1, this study reveals that the SAMU-ES performed

2590 procedures in pre-hospital care to male bicycle accident victims in the year 2014, and such procedures were distributed as follows: 481 (18.6%) of checking vital signs; 479 (18.5%) of measuring partial oxygen saturation through pulse oximetry; 466 (18%) of immobilization on a long board to transport the injured person; 453 (17.5%) application of cervical immobilization through cervical collar; 443 (17.1%) peripheral venous puncture procedures; 168 (6.5%) compressive dressing and 42 (1.6%) immobilization of lower and upper limbs.

It is worth noting that in the analysis of the variables type of injury, anatomical distribution of injuries and procedures performed, the victims suffered more than one type of injury at the same time, had more than one body segment affected and were submitted to more than one type of procedure.

Regarding the type of ambulance (Table 1) used to attend the occurrence, 443 (92.1%) were USB; in 31 attendances (6.4%) it was the Advanced Support Unit and in seven attendances (1.5%) this information was ignored in the BOAPH record.

Regarding the outcome of the pre-hospital care (Table 1), 377 victims (78.4%) were referred to a public hospital; 28 (5.8%) were referred to a private hospital; 28 (5.8%) were not referred to a hospital and in 48 cases (10%) another type of outcome was given.

DISCUSSION

From January to December 2014, 43,618 clinical, trauma, and obstetric and gynecological emergencies were treated by SAMU-ES. Regarding traumatic emergencies, 26,402 involved accidents of various causes, and of this total, 12,857 (48.7%) were related to land transportation accidents, of which 933 (7.25%) involved bicycles. On average there were 77 bicycle accidents per month; about 20 per week and approximately two per day.

These data are consistent with the new reality of Brazilian traffic and emergency care, in which the increasing number of accidents involving land transportation has been a cause for concern, since among the victims the number of pedestrians, cyclists, and motorcyclists involved has been increasing.

The analysis revealed that, regarding the age range, there was an increase in the number of occurrences among men aged 18 to 29 years when compared to the other age groups, and that the number of occurrences decreases as the age range increases.

Similar data have been found in other studies, corroborating the fact that inexperience, impulsiveness, the feeling of pleasure when experiencing risky situations, and self-confidence when driving a vehicle, in general, associated with the lack of knowledge and disregard for traffic safety rules, common in the young male population, may have contributed to an increase in occurrences among

this age group.¹³⁻¹⁴

This information is worrisome to the extent that the impact on socioeconomic aspects is greater among young people, since, since they involve people of productive age, the inevitable absence from work activities and the sequelae resulting from the trauma will reflect on the production of goods and services for the country, without taking into consideration all the priceless costs of accidents, such as physical and emotional pain, psychological suffering, and the withdrawal from social relationships that represent an incalculable cost because it is a subjective aspect of the injured men, their families, and friends.

The fall was shown to be the main trauma mechanism, followed by collision with a motor vehicle, including large automobiles such as buses and trucks. This fact points on the one hand to the cyclist's inability to make use of the bicycle, but on the other hand, it raises the question of what may have contributed to the occurrence of this type of accident.

We can infer that heavy traffic and poor bicycle maintenance and safety conditions may have contributed to the accident.

The present study revealed that most of the occurrences involved falls, causing injuries such as abrasions and cuts and bruises involving the head and face. A study indicates that falls have multifactorial causes of accidents, however, factors such as the lack of cycling infrastructure and segregated space specific for the transit of cyclists, associated with risk behaviors are related to increased risk of falls during bicycle use.¹⁵

Cut wounds are directly related to trauma kinematics, in which the lack of safety equipment makes the body the main area of impact absorption. For nurses, this data should be of great importance, since, although considered superficial injuries, they may be associated with deep tissue lesions, not detected at the time of the accident. In addition, injuries with skin rupture are linked to the risk of bleeding and infection.

The skull and face were the most affected anatomical structures among the occurrences of bicycle accidents involving men analyzed in this research, which is in line with a study that points bicycle accidents as the main causes of trauma to the face and mouth.¹⁶

Injuries to the skull are closely related to neurological and spinal cord injuries. Impacts that affect the regions of the head, face, and dentoalveolar complex need to be carefully evaluated by nurses in order to detect early signs that may point to bone fractures of the spine, especially in the cervical region, since this structure is the first to receive the kinetic energy generated by the impact on the head.¹⁷⁻¹⁸

Spinal cord injuries and traumatic brain injury are configured as one of the leading causes of global morbidity and mortality¹⁷ requiring the nurse to adopt spinal cord protection measures, such as the installation of a cervical collar, and the installation of a longboard to immobilize

the spine, when receiving bicycle accident victims in the emergency room who present head, face, cervical, or dorsal region; exercise caution when moving the patient, and when necessary, perform the mobilization together with other team members so that all body segments are pulled synchronously and together.

Regarding the care of injuries in the mouth, one must consider aspects related to intense bleeding and the risk of asphyxia and bronchoaspiration since the oral mucosa is widely vascularized, in addition to paying attention to feeding, verbal communication, facial aesthetic perspectives, and the social interactions implied in this type of injury.

The mouth is of great importance for the individual's relationship with the world, participating in feeding, verbal communication and affective contacts, being a region of significant importance in both the aesthetic and functional aspects of the individual.¹⁹ When providing care to bicycle accident victims with mouth injuries, the nurse should pay attention to the risk of aspiration of teeth or prostheses, fractures of the maxilla or mandible, and the existence of intraoral bleeding that can lead to asphyxia, especially in unconscious patients.

As for the analysis of the procedures performed in pre-hospital care by SAMU-ES, although not categorized according to the professional who performed them, it is evident the role of the nursing team, responsible, most of the time, for performing such care. Of the more than 2500 procedures performed in the care of male bicycle accident victims, 481 (18.6%) were vital signs measurements, including counting the respiratory rate and heart rate, through carotid and radial pulse, besides checking blood pressure.

The quantity of these procedures performed raises some questions: how high are the costs with the care of male victims of bicycle accidents and the importance of the nurse and his team in the care of these occurrences, to the extent that most of the procedures are the responsibility of the nursing team.

As for the type of ambulance used in the occurrence, the vast majority was the USB, accounting for 92.1% of the total care. It is worth mentioning that, in this type of ambulance, the crew is formed only by nursing professionals besides the driver, revealing the relevance of nursing actions.

The importance of the USB for the Brazilian Mobile Emergency Care Services is presented in studies in which it is verified that most of the calls are made by this type of ambulance, as verified by Dias et al.²⁰ in Rio Grande do Norte; Ribeiro et al.²¹ in Cuiabá, Cestari et al.²² in Ceará and Neto et al.²³ in São Paulo.

As for the outcome of the treatment, most of the occurrences resulted in the victim being referred to a public hospital. This fact reinforces the importance of the public health system in emergency care, requiring the expansion and strengthening of investments in the health

area in order to ensure quality care.

CONCLUSIONS

The data collected and analyzed in this research reveal the importance that bicycle accidents have been assuming nowadays, especially when we have the bicycle as a protagonist in the urban mobility scenario and as a strategy for disease prevention and health promotion.

Whether used as a means of transportation or for work, as a form of recreation and leisure, or as a means of physical exercise, bicycles have been taking up more and more space in contemporary societies for several decades now, awakening interest in their use, especially if we consider their acquisition and maintenance costs.

This fact points to the need to expand the studies related to bicycle accidents in order to support the planning of nurses' actions, especially those who work in pre-hospital and emergency care services, considering the importance that nurses and their teams have in the management of occurrences.

REFERENCES

1. Montero G. Mortalidad por accidentes de tránsito: su determinación social. Distrito Metropolitano de Quito, 2013. Rev. Fac. Nac. Salud Pública. [Internet]. 2020 [acesso em 30 de outubro 2020]; 36(3). Disponível em: <https://doi.org/10.12804/revistas.urosario.edu.co/revsalud/a.9134>.
2. Monteiro CSG, Almeida AC, Bonfim CV, Furtado BMASM. Características de acidentes e padrões de lesões em motociclistas hospitalizados: estudo retrospectivo de emergência. Acta Paul. Enferm. (Online). [Internet]. 2020 [acesso em 30 de outubro 2020]; 33. Disponível em: <https://doi.org/10.37689/acta-ape/2020ao0115>.
3. Rios PAA, Mota ELA, Ferreira LN, Cardoso JP, Santos GJ, Rodrigues TB. Acidentes de trânsito com condutores de veículos: incidência e diferenciais entre motociclistas e motoristas em estudo de base populacional. Rev. bras. epidemiol. [Internet]. 2019; [acesso em 13 de dezembro 2019], 22:e190054. Disponível em: <https://doi.org/10.1590/1980-549720190054>.
4. Ferreira AAM, Souza LZ, Flório FM. Aspectos epidemiológicos e deontológicos da mortalidade no trânsito em Roraima. Revista bioética (Online). [Internet]. 2020 [acesso em 13 de dezembro 2019]; 28(1). Disponível em: <http://dx.doi.org/10.1590/1983-80422020281378>.
5. Barroso Junior GT, Bertho ACS, Veiga AC. A letalidade dos acidentes de trânsito nas rodovias federais brasileiras em 2016. Rev. bras. estud. popul. (Online). [Internet]. 2019 [acesso em 30 de outubro 2020]; 36:e0074. Disponível em: <https://dx.doi.org/10.20947/s0102-3098a0074>.
6. Tavares FL, Leite FMC, Caliman MF, Bomfat PR, Cavaca AG, Antunes MN. Ciclismo e saúde: as matérias sobre bicicleta veiculadas em um jornal de grande circulação no Espírito Santo. Rev. bras. pesqui. saúde. [Internet]. 2018 [acesso em 30 de outubro 2020]; 20(2). Disponível em: <https://periodicos.ufes.br/rbps/article/view/21234>.
7. Carvalho ML, Freitas CM. Pedalando em busca de alternativas saudáveis e sustentáveis. Ciênc. Saúde Colet. [Internet]. 2012 [acesso em 30 de outubro 2020]; 17(6). Disponível em: <https://doi.org/10.1590/S1413-81232012000600024>.
8. Garcia LP, Freitas LRS, Duarte EC. Deaths of bicycle riders in Brazil: characteristics and trends during the period of 2000 - 2010. Rev. bras. epidemiol. [Internet]. 2013 [cited 2020 oct 30]; 16(4). Available from: <https://doi.org/10.1590/S1415-790X2013000400012>.
9. Sousa CAM, Bahia CA, Constantino P. Análise dos fatores associados aos acidentes de trânsito envolvendo ciclistas atendidos nas capitais brasileiras. Ciênc. Saúde Colet. [Internet].

- 2016 [acesso em 30 de outubro 2020]; 21(12). Disponível em: <https://doi.org/10.1590/1413-812320152112.24152016>.
10. Sousa CAM, Bahia CA, Constantino P. Fatores associados ao risco de internação por acidentes de trânsito no Município de Maringá-PR. *Rev. bras. epidemiol.* [Internet]. 2016 [acesso em 30 de outubro 2020]; 9(2). Disponível em: <http://repositorio.unicamp.br/bitstream/REPOSIP/38900/1/S1415790X2006000200006.pdf>.
 11. Ministério da Saúde (BR). Secretaria de Vigilância em Saúde. Departamento de Vigilância de Doenças e Agravos Não Transmissíveis e Promoção da Saúde. *Viva: Vigilância de Violências e Acidentes: 2013 e 2014* [Internet]. Brasília: Ministério da Saúde; 2017 [acesso em 30 de outubro 2020]. Disponível em: http://bvsmms.saude.gov.br/bvs/publicacoes/viva_vigilancia_violencia_acidentes_2013_2014.pdf.
 12. Fernandes CM, Boing AC. Mortalidade de pedestres em acidentes de trânsito no Brasil: análise de tendência temporal, 1996-2015. *Epidemiol. serv. saúde.* [Internet]. 2019 [acesso em 30 de outubro 2020]; 28(1). Disponível em: <https://doi.org/10.5123/s1679-49742019000100021>.
 13. Kienteka M, Camargo EM, Fermino RC, Reis RS. Quantitative and qualitative aspects of barriers to bicycle use for adults from Curitiba, Brazil. *Rev. bras. cineantropom. desempenho hum.* [Internet]. 2018 [cited 2020 oct 30]; 20 (1). Available from: <https://doi.org/10.5007/1980-0037.2018v20n1p29>.
 14. Truchym TC, Custódio IG, Hino AAF. Development and reproducibility of an instrument to assess behavioral and environmental aspects related to cyclist safety. *Rev. bras. cineantropom. desempenho hum.* [Internet]. 2020 [cited 2020 oct 21]; 22: e65714. Available from: <https://doi.org/10.1590/1980-0037.2020v22e65714>.
 15. Jordi M. Study of perceptions regarding health in people who use bicycles as a means of transport. *Salud colect.* [Internet]. 2017 [cited 2020 oct 30]; 13(2). Available from: <https://doi.org/10.18294/sc.2017.1164>.
 16. Tavares FL Coelho MJ, Leite FMC, Lima EFA, Melo EBM, Silva TASM.,. The bicycle accident in Brazil: an integrative review. *Rev. Pesqui.* (Univ. Fed. Estado Rio J., Online). [Internet]. 2019 [cited 2020 oct 30]; 11(1). Available from: <http://dx.doi.org/10.9789/2175-5361.2019.v11i1.263-269>.
 17. Frison VB, Teixeira GO, Oliveira TF, Resende TL, Netto CA. Estudo do perfil do trauma raquimedular em Porto Alegre. *Fisioter. Pesqui.* (Online). [Internet]. 2013 [acesso em 27 de outubro 2020]; 20(2). Disponível em: <https://doi.org/10.1590/S1809-29502013000200011>.
 18. Morais DF, Neto JSM, Spom AR, Meguins LC, Mussi SE, Tognold WA. Image diagnosis of patients submitted to spinal injury. *J. bras. neurocir.* [Internet]. 2013 [cited 2020 oct 30]; 24(1). Available from: <https://jbnc.emnuvens.com.br/jbnc/article/download/1279/1139>.
 19. D'ávila S, Barbosa KGN, Bernardino IM, Nóbrega LM, Bento PM, Ferreira EF. Traumas faciais entre vítimas de acidentes de transporte terrestre. *Braz. j. otorhinolaryngol.* (Online). [Internet]. 2016 [acesso em 30 de outubro 2020]; 82(3). Disponível em: <https://doi.org/10.1016/j.bjorl.2015.10.004>.
 20. Dias JMC, Lima MSM, Dantas RAN, Costa IKF, Leite JEL, Dantas DV. Profile of state prehospital mobile emergency care service. *Cogitare enferm.* [Internet]. 2016 [cited 2020 oct 30]; 21(1). Available from: <http://dx.doi.org/10.5380/ce.v21i1.42470>.
 21. Ribeiro AC. Enfermagem pré-hospitalar no suporte básico de vida: postulados éticos-legais da profissão. *Cogitare enferm.* [Internet]. 2016 [acesso em 30 de outubro 2020]; 21(1). Disponível em: <http://dx.doi.org/10.5380/ce.v21i1.42118>.
 22. Cestari VRF, Sampaio LRL, Barbosa IV, Studart RMB, Moura BBF, Araújo ARC. Tecnologias do cuidado utilizadas pela enfermagem na assistência ao paciente politraumatizado: revisão integrativa. *Cogitare enferm.* [Internet]. 2015 [acesso em 30 de outubro 2020]; 20(4). Disponível em: <http://dx.doi.org/10.5380/ce.v20i4.40819>.
 23. Neto OLM, Silva MMA, Lima CM, Malta DC, da Silva Junior JB. Projeto Vida no Trânsito: avaliação das ações em cinco capitais brasileiras, 2011-2012. *Epidemiol. serv. saúde.* [Internet]. 2013 [acesso em 30 de outubro 2020]; 22(3). Disponível em: <http://dx.doi.org/10.5123/S1679-49742013000300002>.

Received on: 09/01/2020

Required Reviews: 21/10/2020

Approved on: 09/06/2021

Published on: 09/09/2021

***Corresponding Author:**

Fabio Lucio Tavares

Rua Antonio Araujo Lyra, nº 530/705

Vitória, Espírito Santo, Brasil

E-mail address: fabiotavares54@hotmail.com

Zip Code: 29.090-030

The authors claim to have no conflict of interest.