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RESEARCH

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Profile of motorcycle accidents assisted by the Mobile Emergency Service (SAMU) over 2014 and 2015 in a city from the Bahia state

Perfil dos acidentes motociclísticos atendidos pelo Serviço de Atendimento Móvel de Urgência nos anos de 2014 e 2015 em município baiano

Perfil de los accidentes motociclistas atendidos por el Servicio de Atención Móvil de Urgencia (SAMU) en los años 2014 y 2015 en el municipio de Bahía

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ABSTRACT

Objective: The study's purpose has been to describe the profile of the motorcycle accidents assisted by the *SAMU* over 2014 and 2015 in a city from the *Bahia* State, as well as the victim's characteristics, the assistance, the event and the injuries. **Methods**: It is a descriptive, cross-sectional and epidemiological study that was carried out with the collection of secondary data from the records of motorcycle accidents assisted by the *SAMU* from the *Guanambi* city, *Bahia* State. **Results**: During the considered period, 1,319 motorcycle accidents happened, mostly with men (71.7%) within the age group from 20 to 29 years old (36.1%). Underreporting was observed regarding the helmet use and work-related events. The most frequent lesions were multi-site bruising (61.6%) and short-limb injury in the lower limbs (40.8%). **Conclusion**: It is necessary the implementation of preventive measurements with regards to the education, control and improvement of current traffic health policies, aiming to both reduce and prevent accidents.
Descriptors: Transport accidents, emergency medical services, morbimortality, motorcycle.

RESUMO

Objetivo: Descrever o perfil dos acidentes motociclísticos atendidos pelo SAMU nos anos de 2014 e 2015 em município baiano, quanto às características da vítima, do atendimento, do evento e das lesões sofridas. **Métodos**: Estudo epidemiológico, descritivo e transversal, com coleta de dados secundários das fichas atendimentos e livros de registros acerca dos acidentes motociclísticos atendidos pelo SAMU

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de Guanambi/BA, nos anos de 2014 e 2015. **Resultados:** No período ocorreram, 1.319 acidentes motociclísticos, com homens (71,7%), na faixa etária de 20 a 29 anos (36,1%). foi observado o sub-registro quanto ao uso do capacete e relação com o trabalho. as lesões mais frequentes foram as escoriações em múltiplos locais (61,6%) e ferimento corto-contuso nos membros inferiores (40,8%). **Conclusão**: Nota-se a necessidade da implementação de medidas educativas, de fiscalização e aprimoramento das políticas de saúde do trânsito vigentes, tendo em vista a redução e prevenção de acidentes.

Descritores: Acidentes de Trânsito; Serviços Médicos de Emergência; Morbimortalidade; Motocicleta.

RESUMEN

Objetivo: Describir el perfil de los accidentes motociclistas atendidos por el samu en los años de 2014 y 2015 en el municipio de bahía, en cuanto a las características de la víctima, de la atención, del evento y de las lesiones sufridas. **Métodos**: Estudio epidemiológico, descriptivo y transversal, con recolección de datos secundarios de las fichas atendimientos y libros de registros acerca de los accidentes motociclísticos atendidos por el samu de guanambi, en los años 2014 y 2015. **Resultados**: En el período ocurrieron, 1.319 accidentes motociclísticos, con hombres (71,7%), en el grupo de edad de 20 a 29 años (36,1%). se observó el subregistro en cuanto al uso del casco y relación con el trabajo. las lesiones más frecuentes fueron las excoriaciones en múltiples lugares (61,6%) y lesión cortocontuso en los miembros inferiores (40,8%). **Conclusión**: Se nota la necesidad de la implementación de medidas educativas, de fiscalización y perfeccionamiento de las políticas de salud del tránsito vigentes, con miras a la reducción y prevención de acidentes.

Descriptores: Accidentes de Tránsito; Servicios Médicos de Emergencia; Morbimortalidad; Motocicleta.

INTRODUCTION

Transport Accidents (TA) are defined as external causes of morbidity and mortality, and from the 1980s along with the other events, the first cause of death occurred in the general and first mortality for those in the age group from 5 to 39 years old, then making it one of the most serious public health issues to be faced.[1,2]

The expansion of vehicles circulating in the capitals, adjacencies, and cities of the interior has been favoured by the facility that the Brazilian possesses to acquire his vehicle, as a result of the greater access to goods and services. Alongside this, the number of accidents involving these means of transportation grows in parallel, usually due to noncompliance with the law, lack of road structure, signalling and education in transit.[3]

The TAs are defined by the International Statistical Classification of Diseases and Related Health Problems in their 10th revision (ICD-10) in the scope of external causes of morbidity and mortality under codes V01 to V99, such as any accident that is related to a type of vehicle and those that are used at the time of the accident, being subdivided into accidents involving pedestrians, cyclists, motorcyclists, occupants of cars, pick-up trucks and heavy transport vehicles.[4,5]

The World Health Organization (WHO) says that TAs were responsible for more than 1.2 million deaths and caused injuries in 20-50 million people in 2010, with an increasing emphasis on motorcycle accidents, with projections of 1.9 million traffic fatalities in 2020, if preventive measures are not adopted, making this event the second leading cause of premature death.[6]

Given this aforesaid context, motorcycle accidents have been growing considerably because they are a viable vehicle in the slow and congested traffic, with a lower cost compared to automobiles, easy to handle, with advantages in parking, as well as having increased use in moving from home to work and in the tele delivery and motorcycle taxi market.[1,7] Nonetheless, occupants of this type of vehicle are more vulnerable to injury, sequelae, and death, since there are nobody protections and structure8 that absorb the impact.

These facts reflect on costly costs for different sectors of society, including health. Between 2010 and 2016, there were 615,101 hospital admissions for motorcycle accidents in Brazil, which generated an expense of approximately 640 million Reais.[9]

Considering these hospitalizations, 194,796 (31.7%) were in the Northeastern region occupying second place in the ranking by region and among the Northeastern States, *Bahia* State occupied the second place in the period with 35,124 hospitalizations.[9]

Motorcycle participation in the total vehicle fleet in the country increased from 17.6% in 2006 to 22.3% in 2016, evidencing a 26.7% increase in the number of motorcycles in that period, then reaching 34.1% in the Northeast region and 38.4% in *Bahia*.[10]

According to *DATASUS* [Department of Informatics of the Unified Health System], which includes, among others, data from the Mortality Information System (MIS), between 2005 and 2015 there was a 157% increase in fatalities involving motorcyclists in the state of Bahia, an increase higher than that recorded for the whole country, around 102%.[11]

Most of these deaths and disabilities caused by the driver, against you and other victims, could be avoided, since the accident is considered an unintentional and avoidable event, especially when involving risk factors such as alcohol consumption, high speed, use of the cell phone, among others.[4,12]

The implementation of the Brazilian Traffic Code (BTC) in 1998 and complementary laws, municipal traffic control, improved vehicle safety and electronic surveillance, despite important initiatives, are still insufficient to significantly reduce deaths and disabilities.[1]

The increase in the number of cases of TA has been demanding health care. In this scenario, the *Serviço de Atendimento Móvel de Urgência (SAMU)* [Mobile Emergency Care Service] is one of the health services responsible for the initial care of the victims and is the mobile prehospital component of the Emergency Care Network established through the Health Ministry Ordinance No. 1600 from July 7th, 2011.[13]

The purpose of this service is to help the victim early by reducing the chances of suffering, sequelae or even death, thus ensuring adequate care and/or transportation to a health service that is hierarchical and integrated with SUS.1

A study performed in the *Guanambi* city, *Bahia* State (*Guanambi/BA)*, in 2012, showed that, of the 806 records of ground transportation accidents assisted by the SAMU, 580 (72%) were motorcyclists.[14]

In this sense, taking into account the magnitude of motorcycle accidents among the *SAMU* services and its relevance in the early care of victims, this study aimed to describe the profile of the motorcycle accidents assisted by the *SAMU* over 2014 and 2015 in a city from the *Bahia* State, as well as the victim's characteristics, the assistance, the event and the injuries.

METHODS

This is an epidemiological, descriptive and cross-sectional study with the collection of secondary data on motorcycle accidents assisted by the SAMU from *Guanambi/BA*, over 2014 and 2015. According to data from the Instituto *Brasileiro de Geografia e Estatística Brazilian (IBGE)* [Institute of Geography and Statistics], this municipality possessed in 2015, 85,797 inhabitants.[15]

The population of this research was composed of all the medical records of individuals who suffered motorcycle accidents and were rescued by *SAMU* teams in *Guanambi/BA*, as well as those who were treated by the ASU (Advanced Support Unit) regardless of whether they were in the municipality or not from January 2014 to December 2015, considering that these were the most recent full years available at the time of data collection. We searched all the records and service books that included a traffic accident record with motorcyclists.

The variables studied in relation to the victim were: gender, age group and position on the motorcycle; as regards the attendance: month, day, shift of attendance, procedures performed, referrals and the type of unit used; with respect to the accident: place of occurrence, other victim involved, type of vehicle involved, suspected use of alcoholic beverage, use of helmet, work related event and characteristics of the deaths. Regarding the lesions suffered, the following variables were studied: lesion types and sites.

The data were collected between September 2016 and February 2017 by the study team and with the collaboration of the *SAMU* team that searched all the medical records of the service, as well as the records of the occurrences of the years studied.

The collected data were transcribed into the collection form, then tabulated with the aid of the Microsoft Office Excel Program and later treated statistically through the statistical program Epi Info version 7.0, through frequency calculations for the categorical variables and measures of central tendency and dispersion to the quantitative ones.

This research is an integral part of the multicenter project titled "Morbimortality of accidents involving motorcyclists assisted in pre and intrahospital services", which was carried out by the following institutions of higher education: *Universidade Estadual do Sudoeste da Bahia (UESB), Universidade Estadual de Santa Cruz (UESC)* and *Universidade do Estado da Bahia (UNEB).*

The study was submitted and approved by the Research Ethics Committee from the *Universidade Estadual do Sudoeste da Bahia (UESB)*, *Jequié* Campus, under *Certificado de Apresentação para Apreciação Ética (CAAE)* [Certificate of Presentation for Ethical Appreciation] No. 47391615.5.1001.0055, respecting all the ethical precepts that govern researches involving beings humans.

RESULTS

Over the period from 2014 to 2015, there were 1,319 occurrences of motorcycle accidents assisted by the SAMU from *Guanambi* city. Observing these, 57% occurred in 2014 and 43% in 2015, evidencing a 24.6% reduction in the number of accidents occurring in the years studied.

Table 1 - Distribution of the characteristics of victims of motorcycle accidents assisted by the *SAMU, Guanambi/BA,* over the period from 2014 to 2015.

Variable	2014		2015		Total	
	n	%	n	%	n	%
Gender						
Male	531	70.6	415	73.2	946	71.7
Female	219	29.1	151	26.6	370	28.1
NI*	2	0.3	1	0.2	3	0.2
Age Group						
<10 years old	8	1.1	7	1.2	15	1.1
10 to 19 years old	131	17.4	88	15.5	219	16.6
20 to 29 years old	274	36.4	202	35.6	476	36.1
30 to 39 years old	169	22.5	120	21.2	289	21.9
40 to 49 years old	87	11.6	77	13.6	164	12.4
50 to 59 years old	52	6.9	37	6.5	89	6.7
60 years old and more	12	1.6	15	2.6	27	2
NI	19	2.5	21	3.7	40	3
Posição na motocicleta						
Driver	300	39.9	238	42	538	40.8
Passenger	14	1.9	12	2.1	26	2
NI	438	58.2	317	55.9	755	57.2

*NI: No information.
Source: *Serviço de Atendimento Móvel de Urgência (SAMU), Guanambi/BA*, 2017.

Considering these, 71.7% were male, more than double the number of motorcycle accidents involving women, 28.1%. Regarding the age, the victims presented variation from 2 to 73 years old, with an average of 30.3 years old and a standard deviation of 12.1 years. Categorizing the ages in the age groups, the individuals from 20 to 29 years old were 36.1%, for both genders, and there was a reduction in the number of victims with the advancing years of life (**Table 1**).

Concerning the victim's position on the motorcycle, 57.2% of the incidents had no information on this variable and 40.8% were drivers (**Table 1**), of which 44.6% were male.

Table 2 - Distribution of the characteristics of victims assistance related to motorcycle accidents assisted by the *SAMU, Guanambi/BA,* over the period from 2014 to 2015.

Variable	2014		2015		Total	
	n	%	n	%	n	%
Month						
January	44	5.9	52	9.2	96	7.3
February	42	5.6	47	8.3	89	6.8
March	67	8.9	30	5.3	97	7.4
April	66	8.8	37	6.5	103	7.8
May	82	10.9	41	7.2	123	9.3
June	66	8.8	47	8.3	113	8.6
July	59	7.9	63	11.1	122	9.2
August	48	6.4	54	9.5	102	7.7
September	70	9.3	48	8.5	118	8.9
October	76	10.1	45	7.9	121	9.2
November	60	8	46	8.1	106	8
December	62	9.6	57	10.1	129	9.8
Appointment date						
Monday	88	11.7	61	10.8	149	11.3
Tuesday	80	10.6	72	12.7	152	11.5
Wednesday	95	12.6	73	12.9	168	12.7
Thursday	112	14.9	60	10.6	172	13
Friday	110	14.6	66	11.6	176	13.3
Saturday	121	16.1	114	20.1	235	17.8
Sunday	146	19.4	121	21.3	267	20.2
Shift						
Dawn (01:00 a.m. - 06:59 a.m.)	59	7.9	42	7.4	101	7.7
Morning (07:00 a.m. - 12:59 a.m.)	201	26.7	157	27.7	358	21.1
Afternoon (1:00 p.m. - 6:59 p.m.)	282	37.5	220	38.8	502	38.1
Evening (7:00 p.m.- 00:59 p.m.)	209	27.8	147	25.9	356	27
NI*	1	0.1	1	0.2	2	0.2

*NI: No information.
Source: *Serviço de Atendimento Móvel de Urgência (SAMU), Guanambi/BA*, 2017.

The month of December presented a greater number of motorcycle accidents records, with 9.8% of occurrences. As for the day of the week, a higher incidence was observed on Sundays 20.2%, followed by Saturdays 17.8%, with predominance in the afternoon shift 38.1%, which includes from 1:00 p.m. to 6:59 p.m. (**Table 2**).

Table 3 - Distribution of the characteristics of motorcycle accidents assisted by the *SAMU, Guanambi/BA,* over the period from 2014 to 2015.

Variable	2014		2015		Total	
	n	%	n	%	n	%
Location of the accident						
Public route	536	71.3	378	66.7	914	69.3
Rural route	65	8.6	80	14.1	145	11
Highway	128	17	90	15.9	218	16.5
NI*	23	3.1	19	3.4	42	3.2
Other victims involved						
No	293	39	229	40.4	522	39.6
Yes	215	28.6	149	26.3	364	27.6
NI*	244	32.4	189	33.3	433	32.8
Type of vehicle involved						
Motorcycle x car	227	30.2	176	31	403	30.6
Motorcycle x Motorcycle	101	13.4	66	11.6	167	12.7
Motorcycle x bike	7	0.9	6	1.1	13	1
Motorcycle x static object	2	0.3	5	0.9	7	0.5
No other third party/fall	369	49.1	283	49.9	652	49.4
Motorcycle x Pedestrian	10	1.3	4	0.7	14	1.1
Motorcycle x Other	24	3.2	15	2.7	39	3
NI*	12	1.6	12	2.1	24	1.8
Suspected consumption of alcoholic beverage						
No	676	89.9	503	88.7	1,179	89.4
Yes	66	8.8	59	10.4	125	9.5
NI*	10	1.3	5	0.9	15	1.1
Helmet use						
No	50	6.6	48	8.5	98	7.4
Yes	200	26.6	177	31.2	377	28.6
Not observed	51	6.8	17	3	68	5.2
NI*	451	60	325	57.3	777	58.8
Work-related event						
No	6	0.8	7	1.2	13	1
Yes	4	0.5	7	1.2	11	0.8
NI*	742	98.7	553	97.6	1,295	98.2

*NI: No information.
Source: *Serviço de Atendimento Móvel de Urgência (SAMU), Guanambi/BA*, 2017.

The most common accident sites were urban public road 68.7%, followed by highway 16.8%. Regarding the presence of another victim involved, data analyses showed that 39.6% of the accidents did not have another victim involved and in 32.8% of the occurrences there was no record of this information. The majority of accidents occurred by falling without specification 49.4%, followed by a collision with automobile 30.6%. In 89.4% of the cases, the suspected use of alcohol was not recorded (**Table 3**).

The helmet usage was not described in 58.8% of the accidents. In relation to the motorcycle accident in the form of a work accident, it was observed the predominance of occurrences without information of this record 98.2% (**Table 3**).

Considering the individuals treated, (n = 1140, 86.4%) were referred to the public hospital of the municipality. Basic Support Unit (BSU) and (n = 294; 22.3%) were used in the ASU (n = 952; 72.2%).

The average time of regulation on arrival at the scene was 7.2 minutes, ranging from immediate arrival to a maximum of 97 minutes. The average time elapsed on the scene was 14.5 minutes, ranging from one minute to a maximum of 75 minutes.

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Table 4 - Distribution of the characteristics of the injuries suffered by the victims of motorcycle accidents assisted by the *SAMU, Guanambi/BA,* over the period from 2014 to 2015.

Injury type	Injury Site																	
	Head/ Neck		back/ thorax		Abdomen		UL**		LL***		Other		Multiple		NI*		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Excoriation	28	3.1	16	1.8	10	1.1	121	13.5	158	17.7	1	0.1	551	61.6	10	1.1	895	71.7
Short-blunt injury	93	34.8	2	0.8	3	1.1	26	9.7	109	40.8	-	-	34	12.7	-	-	267	21.4
Perforating injury	9	39.1	2	8.7	-	-	4	17.4	8	34.8	-	-	-	-	-	-	23	1>8
Contusion	19	9.5	32	15.9	8	4	40	19.9	78	38.8	-	-	24	11.9	-	-	201	16.1
Open fracture	2	2.9	1	1.5	-	-	11	16.2	51	75	-	-	3	4.4	-	-	68	5.5
Closed fracture	2	1.5	6	4.6	-	-	42	31.8	75	56.8	-	-	6	4.6	1	0.8	132	10.6
Active external bleeding	15	60	-	-	-	-	-	-	8	32	1	4	1	4	-	-	25	2
Burn	-	-	-	-	-	-	-	-	7	100	-	-	-	-	-	-	7	0.6
Other injury	50	45	4	3.6	3	2.7	12	10.8	37	33.3	1	1	4	3.6	-	-	111	9.3

*NI: No information **UL: Upper limbs ***LL: Lower limbs
Source: *Serviço de Atendimento Móvel de Urgência (SAMU), Guanambi/BA*, 2017.

Considering the 1,319 occurrences of motorcycle accidents, there were injuries recorded in (n = 1194, 90.5%), with the most common excoriations being 71.7% in multiple body segments 61.6%, followed by lower limbs 17.7% and upper limbs 13.5%. The blunt injury occurred in 21.4% of the lesions, in the lower limbs 40.8% and in the head/ neck 34.8% (**Table 4**).

Pulse oximetry was the most common procedure performed by first responders (n = 1000, 81.4%), followed by immobilization (n = 812, 61.6%) in long plank and cervical collar (n = 438, 54%), venous puncture (n = 631, 47.8%) and volume replacement (n = 565, 42.8%).

It was observed that there were no deaths (n = 15, 1.1%) of the occurrences, in which (n = 14, 93.3%) were male victims aged 20 to 29 years (n = 5; 26.7%), with the highway being the most frequent site (n = 11, 73.3%). The other most involved parties were an automobile, without another part/fall and motorcycle in which each category presented (n = 2; 13.3%). In these occurrences, the average time of request/arrival on the scene was 10.3 minutes, with a minimum time of 2 minutes and a maximum time of 25 minutes. Regarding these deaths, a total of (n = 10; 66.7%) occurred in 2014 and (n = 5; 33.3%) in 2015.

DISCUSSION

The study showed that motorcycle accidents are more frequent in men, young adults and of productive age and economically active, evidencing their greater exposure to accidents. These results are similar to other studies in different Brazilian cities,[3,7,8,16,17] showing that this type of accident is a worrying issue for public health that requires the improvement of the current traffic health policies, considering the similarity of the profile of the victims affected throughout the national territory.

The greater male aggressiveness in traffic, excessive speed, risky maneuvers, alcohol consumption[3] are hypotheses that may justify their predominance in motorcycle accidents.

Added to the aforementioned factors, inexperience, overconfidence, lack of ability, difficulty in perceiving danger, a transgression of laws, search for challenges and emotions, and optimistic behavioral tendency in not realizing the risk when driving the motorcycle to justify the fact that young adults are more affected by motorcycle accidents.[7,8]

The greater frequency of young adult victims has socioeconomic consequences for society and for families, because as a result of accidents, individuals stop working and generate income, they cause costs to the health system with hospitalizations and rehabilitations due to sequelae and injuries,[3,7] compromising the quality of life not only of the victims, but of the whole family.

Considering the fact that traffic accidents affect especially males, the Health Ministry, through the National Policy of Integral Attention to Man's Health, instituted in 2008, posed this issue as one of the priorities for preventive health actions aimed at since such events can cause psychological, physical, social and economic consequences and young lives are lost in the productive phase.[18]

Although there is a greater incidence of men in the accidents, authors affirm that there is a great possibility of change in this scenario, due to the increasingly frequent insertion of women into the labor market, leading to greater exposure and consequently greater vulnerability.[19]

Nevertheless, in the present study, there was a 31% reduction in female victims, possibly for the short period of time studied, since a comparative study of motorcyclist accidents between 1998 and 2010 showed a significant increase in the proportion of female victims.[20]

The month of December had the highest number of occurrence records, probably because it is a period of festivities that attract consumers and visitors to the municipality, increasing the flow of vehicles. It is recommended to use the month of the accident variable for future studies, since the monthly identification of accidents helps in the organization of the traffic flow, which consequently can reduce the number of TAs.

The weekends (Saturday and Sunday)[7,21] were the days with the highest records of accident care, as in the present study. In these days there are a large number of parties with a consequent increase in alcohol consumption, high speed, taking risky maneuvers and reduction of supervision[22] mainly on Sundays.

Furthermore, researchers point out that the period between Thursday and Sunday presents three times more chances of motorcyclists engaging in accidents, when there is an increase in alcohol consumption, than between Monday and Wednesday, when it decreases.[23]

With regards to the turn of provided assistance service, other studies also reveal the predominance of the occurrence in the afternoon.[8,20] The increase in motorcycle use for work and displacement activities, especially at the exit of work and schools can influence the greater occurrence in this period, besides the fatigue at the end of day[17] and increase of the flow of vehicles.

It was observed the predominance of the accidents in the urban public road. Possibly, factors such as the high flow of vehicles in the municipality, which in 2015 was 41,169, and of these, 18,274 (44.4%) were motorcycles,[24] contravening the laws, associated with reduced inspection, precarious signalling, and structure in some roads and fact two highways cross the urban perimeter cooperate for this reality.

It should also be noted that there was a 24.6% reduction in occurrences in the years studied. Possibly this fact may be related to the greater vigilance and increase of policing in the city, since, in the period, there was a reduction of 29.6% of the accidents in a public way and a 23.7% increase in rural area, where policing does not occur with the same frequency. Therefore, police intervention is extremely important to minimize the occurrence of accidents.

As important as intervening in the critical sections and with a greater concentration of accidents is trying to understand and solve the factors that lead to this scenario, emphasizing not only aspects related to accidents but also the aspects that trigger them.[25]

Other factors that determine the circumstances of the accidents and the severity of their impact are the consumption of alcoholic beverages and the use of helmets since motorcycles are considered a dangerous vehicle because they are small and expose their occupants directly to the impact, the most vulnerable to multiple traumas and of greater intensity.[8]

The consume of alcoholic beverages is considered as one of the risk factors for the occurrence of traffic accidents,[1] as well as for their seriousness, since it affects the driver's reflex capacity and increases the risk of a transgression of the legislation. alcohol consumption is one of the main causes of morbidity and mortality among young men.[21] However, when studying this risk factor, it was observed that the sample of the *SAMU* of the municipality surveyed did not include this variable for filling, being in charge of the rescuer to describe the suspicion or not of the use of alcoholic drink. Therefore, few records were found, and it is not possible to conclude it reliably.

Another factor that may influence the severity of motorcycle TA is the use of protective equipment. The BTC, established by Federal Law No. 9,503, in force since January 21st, 1998, states that the non-use of protection equipment by motorcyclists' size constitutes a serious violation of the Law.[26]

Nonetheless, in the present study, it was observed that in many visits there were no records for this variable, probably due to the non-observation by the rescuer at the time of care, by the victim's withdrawal by the victim himself or by third parties. can intensely move the head and aggravate injuries to the neck, skull, and spine[27] or cause them.

Concerning the work relation, the incompleteness of data was verified here. This may be due to the fact that, at the time of the accident, an emphasis is given to providing care to the victim, without the possibility of a more accurate history of the circumstances of the accident. Given the aforementioned, it is noticed the need to fill these data by the rescuers despite all the demands at the particular moment.

With regards to the injuries caused by motorcycle accidents, bruises were the most frequent followed by blunt injuries, corroborating with other studies.[7,28] Injuries are directly related to the biomechanics of the accident, which is characterized by the shock energy absorbed by the injured body surface that usually collides with the ground and slides on the ground, increasing the likelihood of serious injury and need for hospitalization.[29]

It is worth mentioning that superficial injuries, such as bruising and bruising, may be associated with undetected deep tissue lesions at the time of initial prehospital care, requiring a more detailed diagnostic approach, since they may represent a risk of hemorrhage and infection.[29]

Studies that characterized injured motorcyclists have shown that the areas most affected are the upper and lower limbs, as they are less protected regions.[21,28]

Falls were the most frequent type of accident, as in other studies,[7,20] probably due to the increase in the motorcycle fleet in the municipality, the precarious conservation of some public roads and recklessness in traffic.

The fact that most of the victims are referred to the hospital[3,7] reveals that the service advocates following the protocol established by the Health Ministry since *SAMU* has the objective of carrying out initial care and refer the victim to a health service. hospital health in a timely manner[7] with a purpose of life maintenance, reduction of death, sequelae, and hospitalization.[1]

The assistance provided by the *SAMU* support units is indispensable in traffic accidents, since rapid and specialized care can reduce sequelae and the incidence of deaths,[3] and the time of arrival at the scene and care may be influenced by the location and nature of the occurrences, since there is displacement for transfers in other cities and service in rural areas.

Immobilization through the use of a cervical collar and the use of a long board are considered standard procedures for the care of the *SAMU*, performed both in

the presence of osteoarticular lesions confirmed by the primary examination and in the suspicion based on the kinematics of trauma and the victim's complaint.[30]

Peripheral puncture and volume replacement are used, mainly with the aim of preventing or reversing the installation of hypovolemic hemorrhagic shock in traumatized patients[28] and promoting analgesia.

FINAL CONSIDERATIONS

Although in the present study there has been a reduction in motorcycle accidents, these have been growing constantly over the years and are considered a serious public health problem, mainly for the health of the man, due to the great affection of victims, sequels involved, impact with expenses in health and sometimes death.

Therefore, the knowledge of the profile of the motorcycle accidents assisted by the *SAMU* and the characteristics of this event are fundamental to draw up strategies to deal with this health problem.

The reduction of these accidents depends on more effective and articulated actions among governmental, non-governmental sectors and society; besides greater investment in signalling, improvements in the conditions of public roads and roads, inspection, policing and sensitization of drivers in general and education in traffic, and these actions must be adapted to the local realities.

Hence, it is expected that the present study will serve as an instrument for evaluation, intervention, and implementation of actions both in the development of preventive policies and in the municipal and other governmental spheres.

This study showed some limitations with regards to the underregistration of some variables such as helmet use, alcoholic beverage intake and work-related event, which made it impossible to better analyze them.

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Authors' contributions

All authors contributed to the study design, analysis, and interpretation of the results, writing and critical review relevant to the intellectual content of the manuscript. They also have approved the final version to be published and are responsible for all aspects of the work, ensuring its accuracy and completeness.

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