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Assistance to victims of traffic accidents through the prehospital service: a cross-sectional study

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ABSTRACT

Aim: to evaluate the profile of traffic accident assistance performed by the Mobile Emergency Service (*Serviço de Atendimento Móvel de Urgência* – SAMU) of a city in the South of Brazil. **Method**: a cross-sectional, retrospective and quantitative study, developed with data from 342 victims of traffic accidents attended by SAMU in 2015, statistically analyzed. **Results:** among the victims, men prevailed (71.3%); ages ranged from 15 to 44 years (65.7%); and who were involved in automobile accidents with motorcycles (29.2%). The most frequent lesions were bruises (48.2%) and short-bruises (33.0%); and those involving multiple body sites (50.6%) and lower and upper limbs (85.1%). Advanced support accounted for 75.1% of incidents. **Conclusion:** it was found a statistical association between the mechanisms of accident with age groups, with open and closed fractures and lesions in the upper and lower limbs.

Descriptors: Accidents, Traffic; Emergency Medical Services; Epidemiological Studies.

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INTRODUCTION

The expansion of the fleet of vehicles circulating in the road network and the increase in population have led to a rise in traffic accidents, which are one of the biggest public health concerns in the world, due to their negative impacts on the economy, family and society, arising from the seriousness of the injuries, hospitalizations and fatal victims[1,2].

Traffic accidents are events that occur in a public traffic location, resulting in one or more injured or dead victims, and involving at least one moving vehicle. This group includes collisions between vehicles and between vehicles and pedestrians, animals, and geographical or architectural obstacles[3].

According to the World Health Organization (WHO), these accidents are the ninth leading cause of death in the world, and if measures are not taken, the estimate for 2030 is that these deaths increase abruptly, bringing this cause to the seventh position in the ranking[4]. Worldwide, about 1.2 million people die on the road every year and another 50 million people are injured[5].

According to data from the Ministry of Health, approximately 43 thousand Brazilians die each year due to traffic accidents. This fact characterizes the country as having one of the highest numbers of traffic deaths by South American inhabitants, with a death rate twice that of European countries, similar to the rates of African countries[7].

Traffic accidents are just the tip of the iceberg of the waste of human and social resources brought on by this tragedy. It is considered to be one of the main causes of death among young people aged 15-29 years, and in low- and middle-income countries the most affected age group is the economically active age, especially those under 50. The impact is immeasurable: families are further driven to poverty due to the loss of head of household, and due to medical and hospital expenses and/or the need to care for a family member with disabilities resulting from the injury of the accident[5,6].

More than 75% of victims of serious injuries are carried by pre-hospital services, consisting of doctors and trained nurses[5]. Without that first care at the crash scene, death numbers could be even higher. Adequate pre-hospital care can have a positive impact on morbidity and mortality indicators and thus reduce the damage or sequelae to victims[8].

In this context, the Mobile Emergency Care Service (SAMU), instituted by the National Emergency Care Policy through Administrative Rule No. 1,864, of September 29, 2003, is intended to provide relief to the population in cases of urgency and/or emergency, including in the occurrence of traffic accidents[9].

Considering the magnitude of the repercussions of traffic accidents and the importance of prehospital care as one of the determinants of the survival of the victims, it is necessary to know the epidemiological aspects of these events, simultaneously elucidating the profile of victims, occurrences and services provided by the pre-hospital service.

In view of this fact, this research had the objective of evaluating the profile of traffic accident assistance carried out by SAMU of a city in the South of Brazil.

METHOD

The research followed a cross-sectional, retrospective design, and used a quantitative approach, based on secondary data collected in SAMU Rescuers' Reports (*Relatórios de Atendimento dos Socorristas* – RAS) in a muni-

cipality located in the countryside of Paraná, southern Brazil.

We analyzed the RAS of all victims of traffic accidents of the year 2015, completed by the nursing team after attending the scene of the trauma. The sample consisted of 342 victims, corresponding to 23.4% (n=1461) of all occurrences of traumatic origin attended by SAMU in this period. Regarding the criteria of diagnosis and eligibility for the research, all the victims of traffic accidents were considered, and the records that did not present the mechanisms of the accident were excluded, making it impossible to reach the objective of this study.

It should be noted that in the municipality of the study there are two emergency services: the SAMU and the Integrated System of Attention to Emergency Trauma (*Sistema Integrado de Atendimento ao Trauma em Emergência* – SIATE). There is integration between the two services, and the first to be triggered in a situation of external causes is the SIATE; secondly, the SAMU, is activated in the occurrences that are considered of greater severity and that need the care of the health professionals: the auxiliary/nursing technician and/or the nurse and the doctor.

The municipality has the Urgency and Emergency Regulatory Complex, responsible for the macroregional cluster of care and assistance regulation of 21 municipalities. SAMU has a centralized base and has four Basic Life Support (BLS) vehicles, two Advanced Life Support (ALS) vehicles, a Rapid Intervention Vehicle, and, more recently, an aircraft.

The information was collected from the manual consultation of all RAS, from January to April 2016, and transcribed to a specific instrument that included the related variables: (1) characteristics of the victim: gender, age, injuries presented, and locations; (2) occurrence: period of the day (morning: 06-12h; afternoon: 12h01-18h; evening: 18h01-23h59; dawn: 00h00 - 05h59), day of the week, month, season according to the National Institute of Meteorology (*Instituto Nacional de Meteorologia* – INMET), mechanism of the accident, assessment of traumatic brain injury (TBI), according to the Glasgow Coma Scale (GCS), which considered the scores 13-15 for mild TBI, nine to 12 for moderate, and three to eight for severe, and the severity of the trauma evaluated by the Revised Trauma Score (RTS), considering the scores from 11 to 12 as mild trauma, from eight to 10 as moderate and from three to seven as severe; (3) care: procedures performed by the professionals, response time of care, destination of the victim, service sent to care and region of the city in which the accident occurred.

The data was double-typed in the Microsoft® Excel 2010 program to verify inconsistencies and, therefore, guarantee information quality. They were then compiled in the Statistical Package for the Social Sciences (SPSS) version 20.0 and submitted to exploratory analysis using descriptive statistics (absolute and relative frequencies). To verify the statistical association between the variables, the Pearson chi-square test (X^2) was used, considering a 95% confidence interval and a significance level of 5% ($p<0,05$).

The study had the consent of the coordination of the SAMU of the municipality and respected the formal requirements foreseen in the national and international norms regulating research involving human beings, obtaining approval from the Research Ethics Committee under the Certificate of Presentation for Ethical Appreciation (CAAE) 05931612.8.0000.5231.

RESULTS

In the study period, of the 342 victims of traffic accidents, 244 (71.3%) were males, 96 (28.1%) were females, and in two records (0.6%) sex was not informed. The mean age was 35.6 years (standard deviation - SD=17.6), ranging from three to 90 years. According to Table 1, of the total number of victims, the age group most involved in accidents was 15 to 44 years old, corresponding to 68.0% of male victims and 60.4% of female victims.

Table 1. Victims of traffic accidents attended by the Mobile Emergency Service, according to gender and age group. Paraná, 2015

Age group	Female		Male		P value
	n=96	%	n=244	%	
1-4 years	0	0,0	3	1,2	0,660*
5-14 years	2	2,1	8	3,3	
15-24 years	27	28,1	73	30	
25-34 years	17	17,7	62	25,4	
35-44 years	14	14,6	31	12,8	
45-54 years	12	12,5	28	11,4	
55-64 years	7	7,3	18	7,4	
65-74 years	7	7,3	13	5,3	
≥ 75 years	4	4,2	4	1,6	
Absent	6	6,2	4	1,6	

Source: Research Data, 2015.
**p-value <0,05 chi-square test; on two sheets sex was not informed.*

The mechanisms of the preponderant traffic accidents were automobile with motorcycles (29.2%), followed by automobile accidents (27.5%) and road accidents (22,5%). Regarding the age group, motor vehicle accidents involving motorcycles were more frequent among the victims of 15 to 34 years of age; between 45 and 64 years were the automobile companies; and at the extremes of age, which corresponds to the range between 5 to 14 years and over 65 years, trampling prevailed. There was a statistically significant association between trauma mechanisms and age groups (p<0.001) (Table 2).

Table 3 shows that traffic accidents were distributed in all months of the year, most frequently in May (12.6%) and June (13.5%). For the day of the week, the highest number of occurrences took place between Monday and Thursday, corresponding to 51.2% of the total number of visits. The accidents recorded on the weekends (Friday, Saturday and Sunday) totaled 167 (48.8%), the highest frequency occurring on Saturdays (19,9%). The period of the day when there were more occurrences was nocturnal (36.6%), followed by evening (32.7%), with peak from 5:00 pm to 7:00 p.m. (n = 65). As for seasonality, autumn (36.5%) and spring (23.4%) were the seasons of the year in which the most accidents occurred.

The presence of ethyl breath, declared by the victim or perceived by the team at the time of care, corresponded to 10.2% of the cases. As for the region where the most events occurred, the central area prevailed (32.7%), followed by the eastern zone (16.4%) and the northern zone (15,2%).

Regarding TBI, it was observed that the majority of respondents suffered slight brain lesions (75.4%) according to the ECG classification, and mild trauma (72.2%), according to the RTS. Although accidents involving motorbikes and cars were the most frequent, trampling accidents impacted more victims with severe TBI (n=37,7%). Victims whose ECG scores indicated severe TBI accounted for 21% and, of these, 6.4% were already dead or evolved to death during care.

With regard to the body region most affected by trauma, lesions in multiple sites (50.6%) predominated, followed by lesions at the extremities of the body: lower limbs (45.3%) and upper limbs (39,8%). The most frequent lesions were bruises (48.2%), short-bruised wounds (33.0%) and closed (29.8%) and open fractures (11,7%). In both cases, the

Table 2. Mechanisms of traffic accidents attended by the Mobile Emergency Service, according to age group. Paraná, 2015

Age group	Automotive	Motorcycle	Automotive with Motorcycle	Running over	Rollover	Total	P value
	n=94	n=48	n=100	n=77	n=23	n=342	
	%	%	%	%	%	%	
1-4 years	0,6	0,0	0,0	0,3	0,0	0,9	
5-14 years	0,6	0,3	0,6	2,3	0,3	3,0	
15-24 years	5,9	7,0	11,4	3,8	2,6	29,2	
25-34 years	4,9	3,8	7,9	3,5	3,0	23,4	
35-44 years	4,0	1,2	4,0	3,0	0,3	13,1	<0,001*
45-54 years	5,2	0,9	2,0	2,3	0,6	11,7	
55-64 years	3,2	0,6	1,2	3,0	0,0	7,3	
65-74 years	1,7	0,3	0,9	13,0	0,0	5,9	
≥75 years	0,6	0,0	0,3	1,5	0,0	2,3	
Absent	0,6	0,0	0,9	1,7	0,0	3,2	

Source: Research Data, 2015.
**p-value <0,05 - chi-square test.*

sum is to be greater than 100% because the instrument allows the marking of more than one option of location and type of injury. There was statistical association between the mechanism of traffic accident with open and closed fractures (p<0.05) and lesions reaching the upper and lower limbs (p<0.05) (Table 4).

The ALS team was activated in 75.1% of the occurrences and, in some cases, it was associated with BLS and SIATE. The most performed procedures during the care were the immobilization with the rigid board (54.1%), obtaining a venous access (28.7%) and the immobilization of the cervical spine with the cervical collar (27,5%). In 27.5% no procedures were required or only vital signs were checked. It should be noted that more than one procedure per victim could have been necessary, justifying the sum of more than 100%. The refusal of care or referral occurred in 2.6% of cases.

Table 5 presents the mean of the response time in each phase of the care performed by the BLS and ALS team of the SAMU.

Regarding the fate of the victims after prehospital care, 81.6% were referred to the municipal health services by the SAMU and 5.8% went to the destination with the SIATE. The majority of the cases were referred to tertiary hospitals (57.0%) and 11.7% to secondary hospitals.

DISCUSSION

Through the analysis of the results, it is possible to observe that traffic accidents predominated in young and adult men, as evidenced by a study carried out in Kashan, Iran, where the mean age of the victims was 34.4 years (SD=19.2) and the percentage of men victimized was 82.7%[10].

Men are more vulnerable to injury from external causes because of cultural and biological factors that expose them more often to violent events. The repercussions negatively impact the society and the family structure of the individuals involved: they compromise the work activities, generate early retirements, physical and psychological limitations, and even the interruption of life[4,11].

In this study, a significant association between the mechanisms of traffic accidents

Table 3. Distribution of the mechanisms of traffic accidents attended by the Mobile Emergency Response Service according to month, day of the week, and time of day. Paraná, 2015

Age group	Automotive n=94 %	Motorcycle n=48 %	Automotive with Motorcycle n=100 %	Running over n=77 %	Rollover n=23 %	Total n=342 %	P value
Month							
January	4,3	2,1	6,0	2,6	0,0	4,3	
February	7,4	6,2	5,0	9,1	4,3	6,7	
March	9,6	8,3	5,0	13,0	4,3	8,5	
April	6,4	10,4	13,0	13,0	4,3	10,2	
May	2,6	2,0	4,7	2,6	0,6	12,6	
June	5,0	1,5	2,3	2,6	2,0	13,5	**0,599**
July	0,6	0,6	1,2	1,2	0,6	4,1	
August	2,3	1,5	2,0	1,5	0,6	7,9	
September	1,5	1,2	2,3	1,8	0,6	7,3	
October	3,2	0,3	1,8	2,3	0,3	7,9	
November	1,8	2,0	2,6	0,3	0,6	7,3	
December	2,9	1,2	3,8	1,8	0,6	2,9	
Weekday							
Monday	2,3	2,0	5,3	3,2	0,0	12,9	
Tuesday	2,6	1,5	1,8	2,9	0,3	9,1	
Wednesday	3,2	1,8	3,2	2,3	0,6	11,1	**0,223**
Thursday	5,3	2	4,4	5,0	1,5	18,1	
Friday	3,8	1,5	4,4	3,8	0,3	13,7	
Saturday	4,7	2,9	5,6	3,5	3,2	19,9	
Sunday	5,6	2,3	4,7	1,8	0,9	15,2	
Time of Day							
Morning (06-12h)	4,7	3,8	4,4	3,5	1,2	17,6	
Afternoon (12h01-18h)	8,8	4,4	11,1	6,4	2,0	32,7	0,215
Night (18h01-23h59)	9,6	4,7	10,0	10,5	1,8	36,6	
Dawn (00h00 -05h59)	4,1	0,9	3,5	1,6	1,8	11,9	
Absent	0,3	0,3	0,3	0,3	0,0	1,2	

Source: Research Data, 2015.
**p-value <0,05 - chi-square test.*

and age groups (p <0.001) was found. Among these occurrences, it is possible to highlight the cases of trampling that have been observed in the elderly (>65 years) and in children and adolescents from five to 14 years.

In a study carried out with elderly victims of trauma treated in a tertiary hospital, trampling was identified as the second major cause of hospitalization (28,2%). According to this same study, the elderly are easily hit by the conditions of the structure of the public roads, usually wide avenues that do not allow the crossing in the time determined by the traffic lights[12].

In another study, conducted with children and adolescents victims of traffic accidents, it was found that, in automobile and motorcycle accidents, traffic accidents occurred in 5.8% and 52.5% of cases, respectively; which may be related to the time of leaving school or leisure activities on public roads[13].

By means of the records of the traffic accidents analyzed in this study, it was verified that the occurrences took place more frequen-

Table 4. Analysis of the variables associated to traffic accidents attended by the Mobile Emergency Service, according to the mechanism of the accident. Paraná, 2015

Variables	Automotive n=94 %	Motorcycle n=48 %	Automotive with motorcycle n=100 %	Running over n=77 %	Rollover n=23 %	Total n=342 %	P value
Glasgow Coma Scale							
Light (13-15)	79,8	79,1	79,0	58,4	91,3	75,4	**0,069**
Moderate (9-12)	3,2	2,1	2,0	2,6	0,0	2,3	
Severe (3-8)	15,9	16,7	18,0	37,7	8,7	21,1	
Absent	1,1	2,1	1,0	1,3	0,0	1,2	
Revised Trauma Score							
Light (11-12)	76,6	72,9	77,0	57,1	82,6	72,2	**0,197**
Moderate (8-10)	10,6	4,2	7,0	7,8	4,4	7,6	
Severe (0-7)	0,0	0,0	1,0	3,9	0,0	1,2	
Absent	12,8	22,9	15,0	31,2	13	19,0	
Type of injury 1							
bruises	44,5	56,2	47,0	51,9	39,1	48,2	0,564
Short-blunt wound	35,1	33,3	27,0	40,2	26,1	33,0	0,386
Needlestick and sharp injury	3,2	6,2	0,0	2,6	0,0	2,3	0,166
Contusion	7,4	2,1	3,0	1,3	13,0	4,4	0,060
Open fracture	4,2	20,1	19,0	9,1	0,0	11,7	0,001*
Closed fracture	24,5	16	24,0	44,1	21,7	29,8	0,022*
Dislocation	8,5	0,0	10,0	3,9	13,0	7,0	0,102
Burn	0,0	0,0	1,0	0,0	0,0	0,3	0,658
Laceration	5,3	6,2	9,0	6,5	13,0	7,3	0,691
Part of body hit1							
Head	24,5	29,2	24,0	40,2	17,4	28,1	0,077
Face	29,8	16,7	23,0	37,7	34,8	28,1	0,074
Neck	2,1	0,0	1,0	0,0	4,3	1,2	0,372
Chest	11,7	18,7	7,0	16,9	8,7	12,3	0,180
Abdomen / dorsal / pelvis	6,4	6,2	6,0	16,9	13,0	9,1	0,073
Upper limbs	30,8	37,5	51,0	41,5	26,1	39,8	0,034*
Lower limbs	30,0	58,3	54,0	50,6	17,4	45,3	<0,001*
Multiple	43,0	52,1	52,0	59,7	30,4	50,6	0,120

Source: Research Data, 2015.

**p-value <0,05 - chi-square test; 1more than one answer is allowed*

Table 5. Average time of response (in minutes), in each phase of care for the basic life support and advanced life support of the Mobile Emergency Care Service. Paraná, 2015

Response time in the phases of care	BLS*	ALS*
Time of request until the activation of the team	11 min	13 min
Activation of the team until arrival on the scene	10 min	9 min
Activation of the team until the end of care	52 min	52 min

Source: research data, 2015.

**BLS - Basic life support; ALS - Advanced life support.*

tly between Monday and Thursday, mainly in the late afternoon and early evening. These data were consistent with findings from other studies regarding the time of day, but differed in relation to the days of the week, since they indicated a greater number of occurrences on the weekends[14,15].

According to the literature, accidents are more likely to occur at night due to the increase in the flow of circulating vehicles on the streets at the end of the working day, fatigue after work, visibility limited by the reach of the headlights, disrespect for signs, and abusive use of alcohol and drugs[16]

Still in this perspective, although the central area is not the most populous, some factors may explain that it was the region of the municipality where the greatest number of accidents occurred (32.7%), such as its narrow streets, which present high flow of people and vehicles circulating during business hours, and the fact that it is the region of access to the other localities of the city.

As to the period of the year, accidents occurred more frequently in the fall (36.5%), especially in May (13.5%) and June (12.6%). These data were similar to that found in a study that analyzed the epidemiology of traffic accidents in India, in which the months of May (8.8%) and April (8.7%) prevailed. In India, these months correspond to summer[2], a season that, like autumn in Brazil, is characterized by more cloudiness and humidity.

In a Brazilian study conducted in Paraíba, the month of May was in fourth place (9.4%) in relation to the number of traffic accidents, which occurred more frequently in November (9.9%) and December (9.8% %), that is, late spring and early summer[15]. According to the literature, the use of alcoholic beverages and the flow of vehicles in this period increased, possibly due to the year-end festivities, marriages, and school vacations[1], factors not related to the months in which the number of occurrences was more prevalent in this study.

Regarding the application of ECG and RTS, this study found data similar to those of Paravar's research[10], in which most of the victims presented mild traumatism and a low percentage evolved to death.

The Medical Emergency Regulation Center, an integral part of SAMU, is a physical structure that counts with a regulatory physician who guides and classifies telephone calls according to the seriousness of the situation and directs care to the most adequate support unit[9]. In the present study, the ALS, a team composed of a driver, a nurse and a doctor, attended most of the occurrences. In some cases, it supported the BLS team (consisting of an emergency vehicle driver and a nurse technician or auxiliary) and SIATE (fire brigade), after having performed the first service.

It is noteworthy that, although most of the victims were lightly traumatized, the ALS team was activated more frequently, possibly because the events had the potential to progress to more severe cases due to the characteristics of the injuries and mechanisms of the trauma. This was corroborated by the findings of this study, in which the open fractures ($p=0.001$) and the closed fractures ($p=0.022$), which reached mainly the upper limbs ($p=0.034$) and lower ($p<0.001$), were statistically associated to the mechanism of trauma and were identified in almost half of the occurrences. Among these mechanisms, the occurrences involving motorbikes were those that most affected the extremities of the body. Other studies also showed that the body segments most affected by the accidents were the upper limbs and lower limbs, when added[15,16].

In a survey carried out with motorcyclists, a higher frequency of lesions in the upper and

lower limbs was also evidenced. The latter are the ones that most cause morbidities, which can be explained by the fact that these are the most unprotected areas of the body of motorcyclists[16].

With regard to the procedures performed by the teams, a reduced percentage of these procedures are identified in relation to the total number of care provided. Rigid immobilization occurred in more than half of the cases (54.1%), while the immobilization of the cervical spine was carried out in only 27.5% of the victims - result lower than the percentage of venous accesses (28,7%). These data diverge from the international protocol of trauma, which recommends that the two procedures of immobilization should be, at the same time, the first to be performed[17].

Such procedures may have been poorly performed during care due to the evaluation of the victim by the interventionist physician, who is responsible for defining, through clinical examination, the procedures that he deems necessary.

Regarding the response time of the visits, a study carried out with motorcyclists identified that the time between the request from the user to the service scene was, on average, 39.9 minutes and the total response time, corresponding to the time elapsed from the request to the outcome of care, was approximately 69.1 minutes. These longer delays were justified by the fact that the SAMU base is centralized for the entire municipality[18], whose demographic density and characteristics of SAMU are similar to those of the municipality under analysis in the present study. With this in view, the comparison of the two studies, regarding the response time parameter, suggests a higher efficiency in terms of the prehospital service of the municipality studied here. It is noteworthy that, because SAMU did not record the time the vehicle remained in the accident scene, it was not possible to verify the coherence of this time response with what the literature recommends.

Another attribution of the regulation center is to order the effective flow of referrals within the Health Care Network, according to the severity and necessity of each case[11]. In this study, the highest number of victims was referred to tertiary hospitals (57.0%), mainly to the public health services of reference to trauma and that are part of the Unified Health System (SUS), including victims with TCE classified as light that should be referred to the secondary care network.

Such inconsistency in terms of referrals can be justified by the fact that the parameters of the scores used for the evaluation of the accident victims may not be enough to define the seriousness of the situation and the need for more interventions. In this sense, a more judicious instrument for evaluating and screening victims could help in the determination of procedures and referral to the most appropriate health service, according to the individuality of each case.

In addition, another factor that may have an association with erroneous referrals is the poor integration of care that derives, to a large extent, from the structural precariousness and medical care resources in the referral hospitals[19].

CONCLUSION

The results of this study made it possible to identify a higher prevalence of victims of male traffic accidents, especially in automobile and motorcycle accidents; and in the age range between 15 and 34 years. Victims aged five to 15 and over 65 were most often invol-

ved in running over. A significant association was found between the mechanisms of the accident and the age groups.

The main repercussions of the accidents were injuries in multiple body regions, with predominance of bruises and open and closed fractures, which were statistically associated to the mechanism of trauma and more frequently reached the lower and upper limbs.

Most of the care was performed by the ALS, with subsequent referral to tertiary hospitals. The response time in the different stages of care of the BLS and ALS were similar and considered of high quality.

Knowledge of the profile of victims of traffic accidents, occurrences and the assistance provided by SAMU is of great value, since it is an important instrument for the formulation of strategies for surveillance and urbanization. Moreover, it can support the use of educational interventions, especially for children and youth, in order to lead future drivers and pedestrians to be more conscious and more responsible in traffic.

Through the results of this study, it is desired to broaden the knowledge on the profile of traffic accidents affecting the population of the municipality studied and disseminate it to SAMU professionals, in order to support (re)organization of the service to reduce the shortcomings found in this study, mainly in relation to the information not described and not fulfilled in the RAS, and to provide improvements in the service itself. In addition, the evaluation of the response time of the pre-hospital service can help in the establishment of care quality indicators; therefore, improve patient safety in this area of performance.

The study may have been limited by the underreporting of data in RAS, by the lack of registration of many items in the reports and by the absence of a computerized system to store such data. Although the dynamics of prehospital care may hinder the practice of registration, the information derived from it may contribute to the development of new research that may assist in the implementation of strategies and public policies that alleviate the repercussions of traffic accidents for individuals and for the society.

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