● **Original article**

CHARACTERISTICS OF ROAD TRAFFIC ACCIDENTS BASED ON PUBLIC HOSPITAL SERVICES

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ABSTRACT: Objective: to characterize road traffic accidents based on the services provided in public reference hospitals of the state of Santa Catarina. **Method:** descriptive, quantitative research. Data of the accidents were collected from July to September 2015 through the use of a structured form. The sample consisted of 139 medical records of two emergency units. Descriptive statistics was applied in the analysis. **Results:** the accidents mainly involved men (n=112; 80.6%), aged from 20 to 29 years (n=53; 38.2%). There was a predominance of car/motorcycle accidents (n=44; 31.7%) on Fridays (n=27; 19.4%) in the evening (n=11; 7.9%). Lower limbs represented the most commonly body segment individually affected (n=49; 35.2%). In most accidents (n=95; 68.3%) the patient remained hospitalized for at least 24 hours. **Conclusion:** preventive measures for road traffic accidents should be especially focused on young men that use cars and motorcycles, with an emphasis on traffic control actions on the eve of weekends and actions promoting the use of safety equipment.
DESCRIPTORS: Accidents, traffic; Wounds and injuries; Emergency medical services; Public hospitals.

CHARACTERISTICS OF ROAD TRAFFIC ACCIDENTS BASED ON PUBLIC HOSPITAL SERVICES

RESUMO: Objetivo: caracterizar os acidentes por transporte terrestre atendidos em hospitais públicos de referência no Estado de Santa Catarina. **Método:** pesquisa descritiva e quantitativa. Os dadosdos acidentes foram coletados, de julho a setembro de 2015, mediante formulário estruturado. Constituíram a amostra 139 prontuários de duas emergências. Na análise,aplicou-se a estatística descritiva. **Resultados:** os acidentes envolveram principalmente homens (n=112; 80,6%), de 20 a 29 anos (n=53; 38,2%). Destacaram-se os acidentes de colisão carro/moto (n=44; 31,7%) e ocorridos nas sextas-feiras (n=27; 19,4%) à noite (n=11; 7,9%). O segmento corpóreo mais atingidoisoladamente foram os membros inferiores (n=49; 35,2%). Na maioria dos acidentes (n=95; 68,3%),o paciente ficou hospitalizadopor, no mínimo,24 horas. **Conclusão:** as medidas preventivas dos acidentes por transporte terrestre deverão se voltar, sobretudo, aos homens, jovens, que utilizam automóvel e motocicleta, destacando-se as ações de fiscalização do trânsito próximas ao final de semana e de estímulo ao uso de equipamentos de segurança.
DESCRITORES: Acidentes de trânsito; Ferimentos e lesões; Serviços médicos de emergência; Hospitais públicos.

CARACTERÍSTICAS DE ACCIDENTES DE TRANSPORTE TERRESTRE ATENDIDOS EN HOSPITALES PÚBLICOS

RESUMEN: Objetivo: Caracterizar los accidentes de transporte terrestre atendidos en hospitales públicos de referencia del Estado de Santa Catarina. **Método**: Investigación descriptiva, cuantitativa. Datos de accidentes recolectados de julio a setiembre de 2015, mediante formulario estructurado. Muestra constituida por 139 historias clínicas de dos servicios de urgencias. Los datos recolectados fueron analizados por estadística descriptiva. **Resultados**: Los accidentes involucraron especialmente a hombres (n=112; 80,6%), de 20 a 29 años (n=53; 38,2%). Prevalecieron accidentes de colisión automóvil/motocicleta (n=44; 31,7%) sucedidos en viernes (n=27; 19,4%), de noche (n=11; 7,9%). La zona corporal más afectada individualmente fueron los miembros inferiores (n=49; 35,2%). En la mayoría de los accidentes (n=95; 68,3%), el paciente quedó internado al menos por 24 horas. **Conclusión**: Las medidas preventivas para accidentes de transporte terrestre deberán orientarse particularmente a hombres jóvenes, usuarios de automóviles y motocicletas, destacándose acciones de control de tránsito cercanas al fin de semana, y de promoción del uso de equipos de seguridad.
DESCRIPTORES: Accidentes de tránsito; Heridas y lesiones; Servicios médicos de urgencia; Hospitales públicos.

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INTRODUCTION

Many people that survive road traffic accidents (RTA) acquire temporary or permanent disabilities[1]. The World Health Organization estimates that by 2030 RTA will become the third most common cause of disabilities among the world population[2]. Half the deaths resulting from RTA-related injuries consist of pedestrians, cyclists, or motorcyclists. Young people between 15 and 29 years old represent the most affected group, and 90% of the deaths occur in low- and middle-income countries. In addition to deaths and disabilities, accidents also generate a significant impact on national economies and the families of affected individuals[3].

In this sense, RTAs represent an important public health problem[1]. Considering the Brazilian reality, the mortality rate by RTA in 2013 was 21 deaths per 100,000 inhabitants, resulting, in the whole country, in more than one million potential years of life lost[4]. The hospitalization rate for the same cause corresponded to 85.0 per 100,000 inhabitants, reaching a total cost of over R$230 million funded by the Unified Health System[5]. Among the Brazilian states, Santa Catarina presents the second highest number of deaths by RTA. A total 355 deaths at the moment of the accident occurred in 2012, only in state highways[6].

Considering that the emergency department represents the gateway for people with acute health conditions, including victims of RTA, this study questions: What are the characteristics of road traffic accidents in the services provided in public reference hospitals of the state of Santa Catarina? In order to answer this question, the objective of this paper was to characterize road traffic accidents based on the services provided in public reference hospitals of the state of Santa Catarina.

METHOD

This is a descriptive study with a quantitative approach developed in emergency departments of two public hospitals that are a reference in trauma, both located in the metropolitan area of Florianópolis, Santa Catarina. In addition to São José and Florianópolis, where the study was conducted, this region includes 22 municipalities.

The following inclusion criteria were established for the study: medical records of patients involved in RTA occurred within the period from July 2nd to September 18th 2015, with a minimum age of 15 years, admitted to the emergency services of the mentioned hospitals, that remained or not hospitalized. Medical records of patients that were not at the hospital to authorize the search in their records were excluded. Non-probability, by convenience sampling was used, involving the recruitment, in both the hospitals, of the medical records of RTA patients that met the eligibility criteria throughout the period of data collection. The sample consisted of 139 electronic medical records.

Data collection was conducted by the same researcher in both hospitals, from Monday to Friday, in the morning or in the afternoon. The duty nurse of the emergency department and/or the record system were enquired to identify the RTA patients. Subsequently, after being located and instructed about the study, the patients authorized the search in their medical records, which were accessed to record the data in an electronic form that was previously prepared for this investigation.

The variables included in the form were: age, sex, type of accident, day of the week, shift of the day of accident, body segments individually affected, number of body segments concomitantly affected, and length of stay.

Data were stored, organized, and analyzed with the use of the Epi Info software, version 3.5.2.; simple descriptive statistics was applied (absolute and relative frequencies). A minimum period of 24 hours was considered as hospitalization for the organization and analysis of data regarding length of stay.

The research was approved by the Research Ethics Committee of the Federal University of Santa Catarina under protocol number 1.137.760. All the study participants signed a free and informed consent form. For patients under 18 years old, consent was given by a legal guardian.

RESULTS

RTA-related services in the hospitals evidenced that the patients were mostly men (n=112; 80.6%), and the most affected age groups were from 20 to 29 years (n=53; 38.2%) and from 30 to 39 (n=42; 30.2%), totaling together 68.4% of the services provided.

Regarding the body segments individually affected in each one of the patients, a prevalence of lower limbs (n=43; 30.9%) was observed. However, some patients presented injuries in at least two body segments (n=53; 38.1%), with a predominance of those with two body segments affected (n=37; 26.6%). Regarding length of stay, most of them remained hospitalized for a minimum period of 24 hours (n=95; 68.3%), as shown in table 1.

Table 1 – Characteristics of the services provided due to road traffic accident (n=139) in reference hospitals. Florianópolis, SC, Brazil, 2015

Variable	n	%
Sex		
Male	112	80.6
Female	27	19.4
Age group (in years)		
<20	08	5.8
20 to 29	53	38.2
30 to 39	42	30.2
40 to 49	22	15.8
50 to 59	12	8.6
≥60	02	1.4
Body segment individually affected		
Lower limbs	49	35.2
Upper limbs	13	9.4
Chest	12	8.6
Abdomen	05	3.6
Head	04	2.9
Neck	03	2.2
Number of body segments concomitantly affected		
Two segments	37	26.6
Three segments	13	9.4
Four segments	02	1.4
Five or more segments	01	0.7
Length of hospital stay (in days)		
<1*	40	28.8
1 to 7	37	26.6
8 to 14	31	22.3
15 to 21	10	7.2
22 to 28	08	5.8
29 to 35	02	1.4
>35	07	5.0
Unidentified	04	2.9

Legend: *<1 = less than 24 hours.

The most common types of RTA were: car/motorcycle accident (n=44; 31.7%); motorcycle fall (n=24; 17.3%); unspecified motorcycle crash (n=13; 9.4%); trampling (n=10; 7.2%), and motorcycle/other vehicle (truck, school van, tractor, or ambulance) accident (n=9; 6.5%), as shown in figure 1.

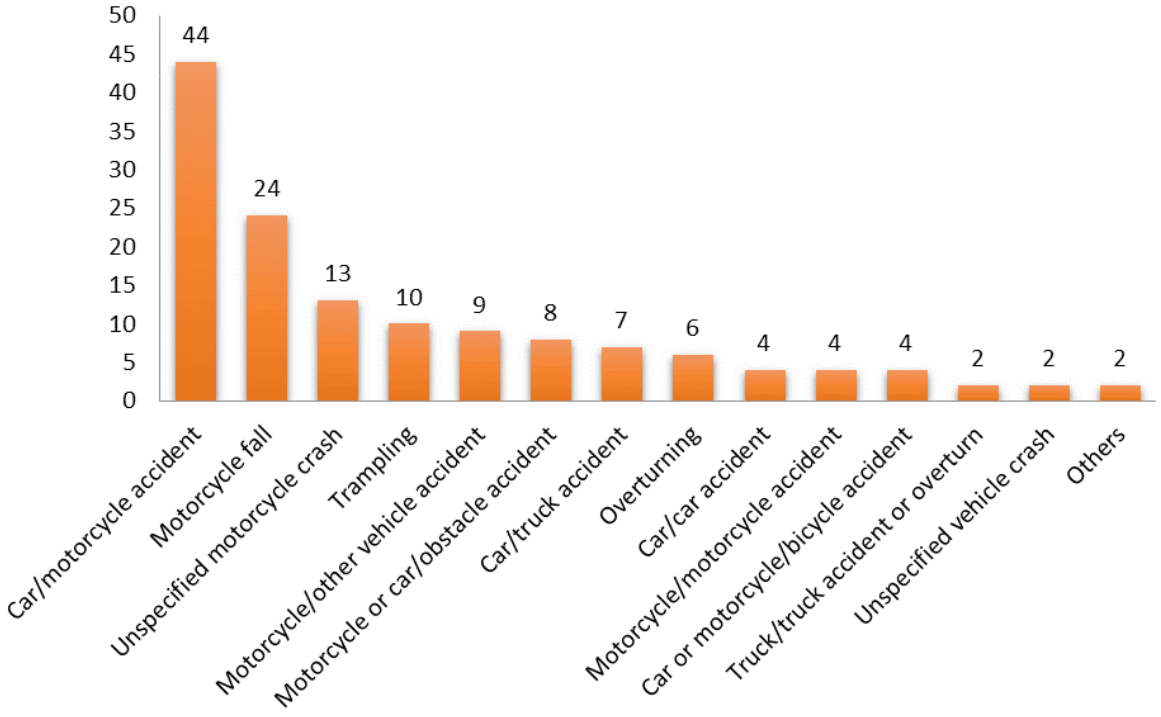
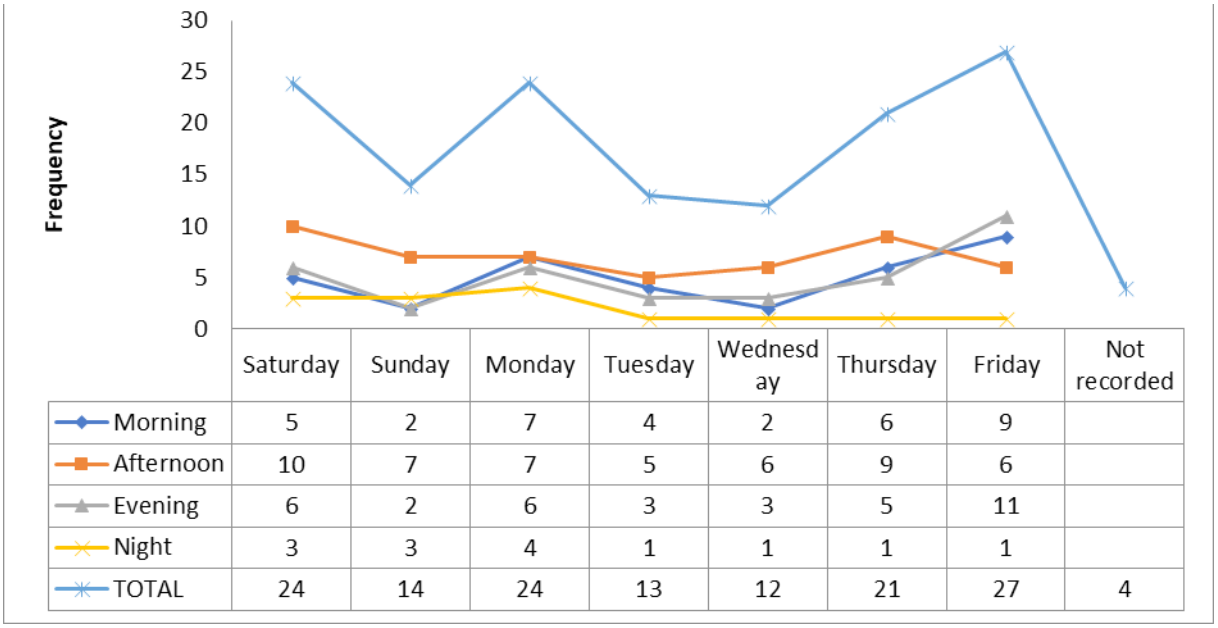


Figure 1 – Absolute frequency (n=139) of the types of road traffic accidents based on the services provided in reference hospitals. Florianópolis, SC, Brazil, 2015

Regarding the shift of occurrence of the RTAs, a higher number of accidents was observed in the afternoon (n=50; 36%) and in the evening (n=36; 25.9%), totaling 61.9% of the cases. The day of the week that presented the higher number of accidents was Friday (n=27; 19.4%), followed by Saturday (n=24; 17.3%) and Monday (n=24; 17.3%). It is important to observe that the frequency of accidents at night was equivalent from Tuesday to Friday (n=1; 0.7%). Considering the day of the week and the shift of the day, concomitantly, the highest number of accidents occurred on Friday evenings (n=11; 7.9%), as shown in figure 2.



	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Not recorded
Morning	5	2	7	4	2	6	9	
Afternoon	10	7	7	5	6	9	6	
Evening	6	2	6	3	3	5	11	
Night	3	3	4	1	1	1	1	
TOTAL	24	14	24	13	12	21	27	4

Figure 2 – Day of the week of the occurrence of the accident (n=139) according to the period of the day. Florianópolis, SC, Brazil, 2015

DISCUSSION

The results evidenced that the patients involved in RTAs present similar characteristics to those identified in other studies, with young men representing the most affected group[7-11]. In Iran and Sri Lanka, for example, most individuals involved in these accidents were men, with 32.5% and 26% aged between 20 and 29 years, respectively[11-12], an age group that corresponded to 38.2% of the patients in this study.

This population group is more prone to RTAs due to the higher level of exposure to risk situations, such as lack of driving experience, driving beyond permitted speed limits, exposure to more risky driving practices, and driving after the use, sometimes abuse, of alcohol, among others[10]. Thus, reducing RTAs among young people requires the use of specific strategies such as measures of education to change habits and behaviors and intensification of control with actions coordinated among different sectors[13].

A predominance of lower limbs injuries was observed in patients that had only one body segment affected, a finding that was also identified in similar research conducted with the Mobile Emergency Care Service[9]. In contrast, in Iran the upper limbs were the most commonly affected body segment among the patients, followed by head and neck[11], whereas in Nigeria head and neck represented the most commonly affected body segment[14], a fact that may be associated with the non-use of seat belts and helmets, equipment of mandatory use in Brazil. In Kenya, for example, the use of a helmet among motorcyclists was found to be associated with a significant reduction in the number of head injuries[15].

Patients presenting injuries in more than one body segment represented less than half of the sample, an aspect that differs from other studies. At national and international levels, most RTA-related patients presented multiple body segments affected[9,11] and the presence of several injuries is a predictor of in-hospital mortality[11]. It is possible to infer that, in RTA patients, the affected segments and the number of affected segments are related to the type of accident.

In this sense, research involving only motorcycle accidents evidenced a predominance of lower limb injuries[8,16]. A study including only patients with traumatic brain injury resulting from motorcycle accidents identified that most patients suffered injuries in other body segments as well[17]. This points out that the exposure of the individuals, typical of motorcycle accidents, may cause injuries in multiple body segments.

Regarding hospitalizations due to traffic accidents, an increase has been observed in the last decades, particularly in those involving motorcycles[18]. The frequency of hospitalizations due to RTA in the investigated institutions (most of them remained hospitalized for a minimum of 24 hours: n=95; 68.3%) differs from another study conducted in Santa Catarina, which presented a hospitalization rate of 33%[7].

These findings may point out the relationship to the type of accident and severity of the injury, taking into account that most patients remained hospitalized for a minimum of 24 hours. The condition of the individual in traffic (cyclist, pedestrian, etc.) determines the severity of the injuries[19].

In the city of São Paulo the frequency of hospitalizations with duration from 0 to 7 days due to motorcycle accidents represented 76.9% of the cases[20], a higher percentage than the number identified in this study (55.4%), considering the patients that were discharged within less than 24 hours and those that remained hospitalized from one to seven days as a result of all types of road traffic accidents. Minas Gerais registered an average of 6.1 days of hospitalization per RTA patient. Pedestrians represented the patients hospitalized for longer periods (average length of stay of 6.4 days) as a result of trampling, and vehicle passengers presented the highest levels of lethality (4.6 and 5.1%, respectively)[18].

A similar average length of stay (6.3 days) was evidenced throughout the national territory, with 170,805 hospitalizations due to RTA registered in 2013, representing a major problem and significant costs to the health sector[5]. In the same year, a less favorable result in relation to length of stay was found in Spain, where the average period of hospitalization due to RTA was 8.65 days[21].

In the 139 investigated medical records, it was found that the main types of RTA involved motorcycles, as follows: car/motorcycle accident; motorcycle fall; and unspecified motorcycle accident. Corroborating these findings, a study revealed the accidents between vehicles as the most predominant type of accident, with motorcycles representing the main vehicle involved in accidents with victims[22]. Although most users of motorcycles feel that they are at high risk of getting involved in accidents, they still use this vehicle mainly for leisure purposes or to go to work or school[23].

Accidents between cars and motorcycles are also identified as the predominant type in Iran[11], with similar statistics to this study. In Brazil another study revealed this type of accident as the most common; however presenting a higher quantity, evidencing that the data found are compatible with the different road realities of the country[24].

Similarly to this study, motorcycle falls represented the second most common cause of RTA in the state of Piauí[24]. Conflicts occurred in the traffic with more susceptible vehicles[19] are among the causes of this type of event.

Regarding the shift of occurrence of the RTA, a predominance of accidents occurred in the afternoon was observed, followed by those occurred in the evening. An inverse result (evening and afternoon) was identified in the country in similar investigations involving only motorcycle accidents[17,25], as found at the international level, with research covering different types of RTA[11]. Tiredness of drivers generated over the day, the flow of vehicles after the working period, impaired visibility due to reduced lighting after dusk, reduced control by the police, and abuse of alcohol and illegal drugs represent the causes of the higher number of accidents in these periods of the day[25].

Particular data related to RTA refers to events occurred at night. The smallest number of cases in this period may be particularly related to the reduced flow of vehicles and consequent accidents.

In relation to the day of the week of the occurrences, a higher frequency was observed on Fridays, followed by Saturdays and Mondays. It is important to mention that Florianópolis is a tourist city, with natural attractions and bohemian life, with a variety of pubs and night clubs that drive the night life, especially on Fridays and Saturdays, a fact that might contribute to the higher number of accidents occurred in these days.

Comparatively, other research developed in Brazil pointed out weekends (Saturday and Sunday) as the days of highest occurrence of RTA[8-9], which refers to free traffic, absence of congestions, and use of alcohol[19]. A study conducted in Nepal evidenced that accidents occur mostly on Saturdays, also suggesting a relationship to the fact that people leave their homes on this day for different purposes, as it represents the only day-off in the week in the country[26].

Regarding the limitations of this investigation, the authors recognize that the type of adopted sampling and the definition of a period for data collection may limit the generalization of the results, requiring caution by the researchers in the interpretation of the findings and elaboration of conclusions. However, the fact that the hospitals participating in the research are reference in the state in the provision of care for individuals affected by RTA-related trauma points out that the used sample characterizes this type of accident, especially in relation to those occurred in the metropolitan region of Florianópolis.

● CONCLUSION

In the services provided in reference hospitals of Santa Catarina, RTA patients were mainly young, men, involved in motorcycle falls or car/motorcycle accidents, with the latter representing the predominant type. Lower limbs were the most commonly body segment individually affected, and

patients that remained hospitalized for a minimum period of 24 hours stood out. Regarding the shift and day of the occurrences, a higher number of accidents was identified on Friday evenings.

The characterization of the road traffic accidents in the hospital context may support the planning of nursing and health care in general. It is essential for the planning of public policies in this area so they may be more effective, with a consequent reduction of morbidity and mortality resulting from this type of accident.

In this sense, preventive measures for accidents should be especially focused on young men that use cars and motorcycles, emphasizing traffic control actions on the eve of weekends and actions promoting the use of safety equipment to protect the body integrity.

Longitudinal and correlational studies on the theme are suggested for further investigations in order to assess the trend of RTA in the state of Santa Catarina and their associated factors, respectively.

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