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Original Article

Perception of health professionals on the occurrence and prevention of accidents with rescue teams from the Mobile Emergency Care Service (SAMU)

Percepção dos profissionais de saúde acerca da ocorrência e prevenção de acidentes com socorristas do Serviço de Atendimento Móvel de Urgência (SAMU)

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ABSTRACT: According to the World Health Organization (WHO), traffic accidents are one of the leading causes of death by injury in the world. The increase in accidents on public roads and highways requires the improvement of actions developed by rescue teams, who expose their lives and are constantly in unsafe situations, whether inside moving ambulances or when they are working in the accident scene. This study aimed to assess the perception of professionals on the occurrence and prevention of accidents with SAMU Maringá rescue teams. This is an exploratory qualitative and quantitative study. The research was carried out through the application of a questionnaire with professionals working at SAMU Maringá. The results showed the need for priority interventions that guarantee: continuing education to adapt the behavior of rescue teams, awareness of the population, and adjustment of signaling, guaranteed by a minimum of 03 first responders and adequate signaling materials. This research allowed understanding the perception of the team of professionals working in SAMU M/SNNP on the possible factors associated with accidents with rescue teams, indicating the need for adequate signaling and isolation of accident scenes and continuing training for the protection of the rescue team during pre-hospital care on public roads.

Keywords: Emergency medical services; Risk management; Accident prevention; Occupational mortality; Accidents, occupational.

RESUMO: A Organização Mundial da Saúde (OMS) menciona como uma das principais causas de morte por trauma no mundo as decorrentes de acidentes de trânsito. O aumento de acidentes em vias públicas e rodovias exige o aprimoramento de ações dos socorristas, que expõem suas vidas, ficando constantemente expostos a situações inseguras, seja dentro da ambulância em movimento ou quando estão atendendo no local do incidente. Este estudo objetivou identificar a percepção dos profissionais de saúde acerca da ocorrência e prevenção de acidentes com socorristas do SAMU Maringá. Trata-se de um estudo quali-quantitativo exploratório. A pesquisa ocorreu através de aplicação de questionário realizada com profissionais atuantes no SAMU Maringá. Os resultados demonstraram a necessidade de intervenções prioritárias que garantam: a educação continuada a fim de adequar a conduta dos socorristas, conscientização da população e otimização da sinalização garantida pelo atendimento mínimo com 03 socorristas e com materiais sinalizadores adequados. Esta pesquisa permitiu identificar a percepção da equipe de profissionais atuantes no SAMU M/SNNP sobre os possíveis fatores promotores de acidentes com equipes de socorristas indicando a necessidade de uma sinalização e isolamento adequados das cenas de acidentes e treinamento permanente no sentido de proteção da equipe de socorristas durante o atendimento pré-hospitalar em vias públicas.

Palavras-chave: Serviços médicos de emergência; Gestão de riscos; Prevenção de acidentes; Mortalidade ocupacional; Acidentes de trabalho.

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INTRODUCTION

According to the World Health Organization (WHO), traffic accidents are one of the leading cause of death by injury in the world, with lethality around 90% in middle and low-income countries. Each year approximately 1.2 million people around the world die as a result of traffic collisions, with approximately 3,000 deaths per day and 20 to 50 million significant injuries. Road traffic injuries are the leading cause of death for people between 15 and 44 years of age, affecting an important age group of the workforce. The damage caused by traffic accidents can cost around 1 to 1.5% of the Gross National Product in developing countries and 2% of Gross National Product in developed countries[1].

In Brazil, from January 2018 to May 2022, 4,860,248 vehicles were involved in accidents, leading to 5,687,026 injuries and 100,022 deaths. In the State of Paraná, in the same period, 380,779 vehicles were involved in accidents, leading to 606,923 injuries and 7,359 deaths[2].

The SAMU – Mobile Emergency Service is part of the Brazilian Emergency Care Policy and its general objective is to reduce the number of deaths, the length of stay in hospitals and the consequences of lack of early care through emergency response. Its priority is quality patient care, not just patient transportation. The SAMU has a multidisciplinary team that coordinates the service, so that it operates in an organized manner. All these jobs and the profile of these workers are specified in the legislation[3].

Ordinance No. 814, of 06/01/2001, of the Ministry of Health, establishes the "Standardization of Mobile Pre-Hospital Emergency Care Services" and recognizes the professionals: doctor, nurse, nursing technician, nursing assistant and driver, as those capable of effectively operating as members of this team. These professionals act in Basic Life Support (BLS) teams, trained to deal with moderate risks, and Advanced Life Support (ALS) teams, who provide assistance to more severe cases, which require complex interventions and immediate response[4]. In addition to these professionals, the service coordinator, the technical manager, the nurse manager, telephone operators, and radio operators are also part of the SAMU team[4,5].

When caring for the injured, first responders can often make the difference between life and death, or between temporary, severe and permanent disability. Studies show that the prognosis of trauma patients depends on the first and subsequent people who assisted them. Doctor Cowley, founder of the Center for Emergency Medical Services in the USA, developed several studies and observed and created the "Golden Hour" concept, which refers to initial care provided in an adequate and timely manner, considering that patients who received definitive treatment soon after the injury had a much better prognosis than those whose care took longer[6,7].

The Brazilian norms for the standardization of safety and health at work for health care professionals aim to guide the worker on prevention and conduct against accidents at work. To this end, Regulatory Norm (NR) 32, of November 11, 2005, in Law No. 6,514 of 1977, establishes the basic guidelines for the implementation of measures to protect the safety and health of health care workers, as well as those who carry out activities of health promotion and health care in general. Among the measures indicated to protect the safety and health of workers, the training of health professionals stands out as a strategy to improve knowledge, safety, and health in the workplace and to help identifying risks to prevent accidents among rescu teams treating patients on public roads[6,7,8,9].

The relevance and currentness of the subject justify the present study, which aims to provide results that can support the reassessment and adoption of actions aimed at guaranteeing the safety and quality of life of health professionals in pre-hospital care by the institution and by the people involved.

METHODOLOGY

The SAMU – Mobile Emergency Care Service of Norte Novo do Paraná (SAMU M/SNNP) was inaugurated on August 26, 2016. Its headquarters is located in *Jardim Ipanema, at Rua Pioneiro Antônio Paulo da Silva, no.* 191, in the city of Maringá (PR). Its service is available to a population of almost 800,000 people and it is a reference for patient care in the 30 cities of the region under the jurisdiction of AMUSEP - Association of Cities of the *Septentrião Paranaense*, identified by the PROAMUSEP Consortium. It has decentralized municipal branches, with ambulances available in the cities of *Maringá, Sarandi, Paiçandu, Mandaguari, Astorga, Colorado and Nova Esperança*. The city of *Maringá* has 3 local branches: *Base Zona Norte, Base Zona Sul and Base de Regulação*.

This is an exploratory qualitative and quantitative study assessing the occurrence of possible accidents with teams of rescuers from *SAMU Maringá*, when working in public roads. The National Register of Health Establishments (CNES) provided the number and functions of the 62 professionals working at *SAMU Maringá*, distributed in three bases: *Base Zona Norte, Base Zona Sul and Base de Regulação*.

A questionnaire with six questions aimed at health professionals working in *SAMU Maringá* was elaborated (Figure 1). The inclusion criteria for the survey was being a Health Professional linked to *SAMU Maringá*. Health professionals and other professionals who were not linked to *SAMU Maringá* could not participate in the survey.

Survey with professionals from SAMU Maringá/SAMU Norte Novo do Paraná about possible occurrences and prevention of accidents with rescue teams during service on public roads

IDENTIFICATION

Age:

Gender: ( ) Male ( ) Female

Occupation:

Time working at SAMU Maringá/SAMU Norte Novo Paraná:

1) Do you believe that an accident with the rescue team during assistance on a public road can occur?

( ) Yes ( ) No

2) Have you ever heard of an accident with a rescue team from SAMU Maringá/SAMU Norte Novo do Paraná?

( ) Yes ( ) No

3) Have you ever witnessed an accident with the SAMU Maringá/SAMU Norte Novo team?

( ) Yes ( ) No

4) Have you ever been a victim in an accident with the the SAMU Maringá/SAMU Norte team?

( ) Yes ( ) No

5) For you, what are the reasons for accidents with the rescue team during emergency care??

( ) **Failure in** the staff protection protocol

( ) **Failure to follow** staff protection protocol

( ) **Failure in the signals** that show there is an emergency service at that place

( ) **Other.** Explain:

6) What is your suggestion to improve the prevention of accidents with rescue teams during assistance on public roads? (use the back if necessary)

Source: the authors.

Figure 1: Survey with Health Professionals from *SAMU Maringá*, member of *SAMU Norte Novo do Paraná*, about possible occurrences and prevention of accidents with rescue teams during assistance on public roads.

Due to the COVID-19 pandemic and to comply with current health security measures, avoiding contact and risks, self-explaining devices were installed simultaneously at the three *SAMU* M/SNNP bases for *SAMU* M/SNNP professionals to sign the list of participation and the informed consent form and put them in an identified and sealed container for the informed consent form, and for them to respond to the survey, without identifying themselves and also put it in an identified and sealed container for the surveys. The material was available to professionals at strategic locations, defined by the local nursing team, from 02/17/2021 to 03/12/2021. The surveys collected were analyzed qualitatively and quantitatively, establishing a 5% rejection level for the null hypothesis.

For data analysis, descriptive statistical analysis was performed using the program Excel, where percentages were calculated and tables and graphs were constructed to help characterize the professionals and find significant information to meet the objectives of this study. The project was presented to the Permanent Commission for the Evaluation of Research and Extension Projects, of the Municipal Health Secretariat of *Maringá* (PR) (CECAPS) along with the Coordination of Urgency and Emergency - *SAMU*, and was approved on February 19, 2020.

Subsequently, the study was sent to the Research Ethics Committee of the *Universidade Estadual de Maringá* (PR) (COPEP-UEM) and was approved under number 4,433,082, on December 2, 2020. After being approved by the COPEP-UEM, the project returned to the Planning Management/CECAPS of the *Municipal* Secretariat of *Maringá* - PR to require authorization to enter the service and start the research, which was granted. Through Internal Communication, access to SAMU bases was authorized, and data collection was initiated.

RESULTS

A total of 43 health professionals responded to the survey, representing 69.35% of the *SAMU Maringá* health care staff. Table 1 shows the profile of the interviewed

professionals. These professionals are divided in three sectors around the town. Most interviewees (41.9%) worked in the Regulation sector, while 23.3% worked in the North and 34.9% in the South sector. Most respondents were female (55.8%). The mean age of the interviewees was 40 years old, with a standard deviation of 9 years. Approximately 72% of the professionals were between 31 and 50 years old when interviewed.

Regarding their profession, 39.5% of respondents had been in this job for 4 to 8 years. The minority (16.3%) had less experience (up to 2 years) in the function. Most professionals (30.2%) were nurses, followed by ambulance drivers (20.9%) and medical regulation assistants -TARM (telephone operator) (16.3%).

Table 1 - Profile of professionals from *SAMU Maringá/SAMU Norte Novo do Paraná* (n=43) March /2021

Profile	No	%
Sector		
North	10	23.2%
Regulation	18	41.9%
South	15	34.9%
Gender		
Female	24	55.8%
Male	19	44.2%
Age		
Up to 30 years old	6	14.0%
From 31 to 40 years old	18	41.8%
From 41 to 50 years old	13	30.2%
51 years old or older	6	14.0%
Time in the service		
Up to 2 years	7	16.3%
From 2 to 4 years	8	18.6%
From 4 to 8 years	17	39.5%
More than 8 years	11	25.6%
Occupation		
Management	1	2.3%
Nursing Assistant	2	4.7%
Operational Assistant	2	4.7%
Ambulance Driver	9	20.8%
Fleet Control	1	2.3%
Nurse	13	30.2%
Doctor	3	7.0%
Radio operator	2	4.7%
TARM	7	16.3%
Nursing Technician	2	4.7%
Telephone Operator	1	2.3%

Source: the authors.

Table 2 shows that all SAMU Maringá professionals interviewed believe that an accident with the rescue team during assistance on a public road can occur. About 91.0% reported they had heard of accidents with teams of rescuers, almost 21.0% had already witnessed an accident with the team and 9.3% had already been victims of an accident.

Table 2 – Professional experiences related to accidents during the assistance provided by *SAMU Maringá/ SAMU Norte Novo do Paraná* – March/2021

EXPERIENCES	Yes	No
An accident with the rescue team during assistance can occur	100,0%	0,0%
Had heard of an accident	90,7%	9,3%
Had witnessed an accident with the Team	20,9%	79,0%
Had been a victim in an accident with the Team	9,3%	90,7%

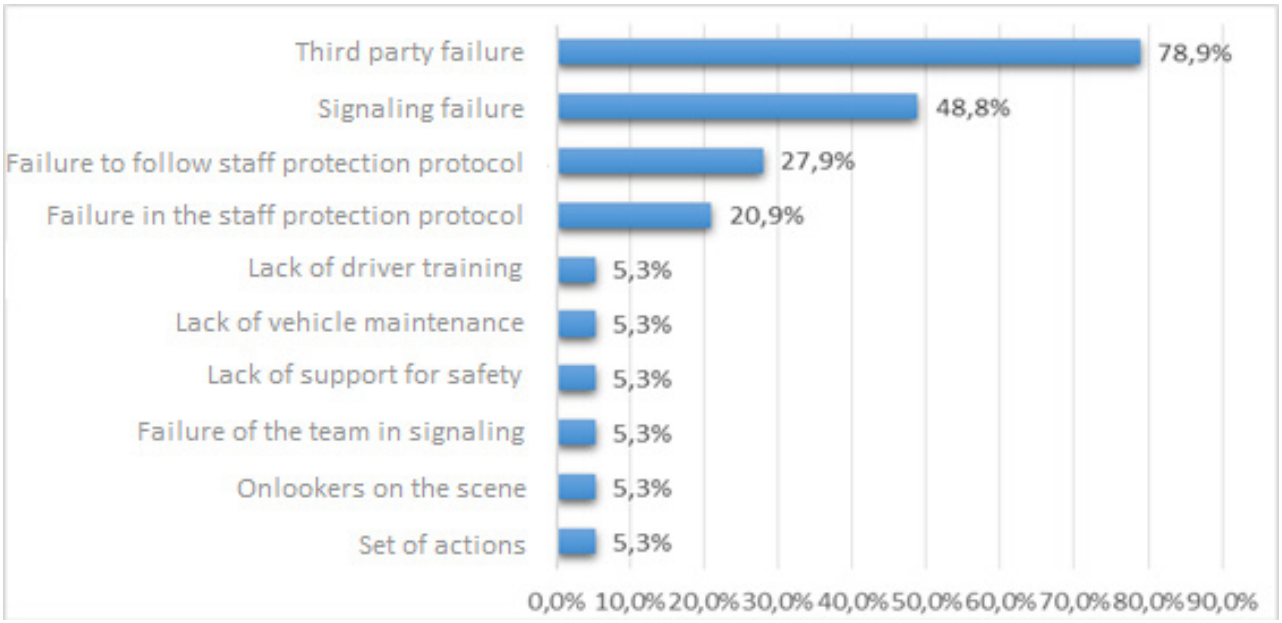
Source: the authors.

When asked about the cause of accidents with the team of rescuers during assistance, almost 50% of respondents mentioned failure in signaling, 27.91% reported failure to follow staff protection protocol, 20.93% said that there is a failure in the staff protection protocol and 44.19% of respondents indicated other reasons listed in Table 3.

Table 3 – Reasons for accidents with the rescue team during emergency care in *SAMU Maringá/ SAMU Norte Novo*. March/2021

For you, what are the reasons for accidents with the rescue team during emergency care?	%
Third party failure	78.9%
Signaling failure	48.8%
Failure to follow staff protection protocol	27.9%
Failure in the staff protection protocol	20.9%
Set of actions	5.3%
Onlookers on the scene	5.3%
Failure of the team in signaling	5.3%
Lack of support for safety	5.3%
Lack of vehicle maintenance	5.3%
Lack of driver training	5.3%

Source: the authors.



Source: the authors.

Figure 2- Answers to the question: For you, what are the reasons for accidents with the rescue team during emergency care? - Item Other. *SAMU Maringá/SAMU Norte Novo do Paraná. Maringá* (PR), March/2021.

The survey also collected suggestions to improve the prevention of accidents. More than half of the interviewees said that there should be team training and adaptation of protocols (51.2%). Another frequent suggestion was population awareness (41.9%). Use and/or adjustment of signaling and support from the Department of Transportation of the City of *Maringá-SETRAN* and Military Police-PM to protect the scene were also suggested, as shown in Table 4.

Table 4 – Suggestions to improve the prevention of accidents with rescue teams during assistance on public roads according to the professionals working at *SAMU Maringá/ SAMU Norte Novo Paraná*

What is your suggestion to improve the prevention of accidents with rescue teams during assistance on public roads?	**%**
Team training and adequacy of protocols	51.2%
Population awareness	41.9%
Use and/or adjustment of signaling	27.9%
Support from SETRAN and PM teams for protection of the scene	18.6%

DISCUSSION

The descriptive data regarding the *SAMU* M/SSNNP professionals revealed that the configuration of the multidisciplinary team guarantees that the service is performed in an organized way. As for length of service, it was found that most professionals had experience in the area, as they had been working on *SAMU* M/SNNP for an average of 8 years or more, which is very positive for the performance of the team and for an effective service to the victims.

Studnek et al.[10] conducted a survey in the United States to assess the characteristics of health professionals involved in ambulance accidents. A total of 32% of team members participated and 8.6% reported being involved in an ambulance crash. There was a higher odd of involvement in accidents among younger professionals and those with sleep disorders. In the present study, 69.35% of the team members responded to the survey and 9.3% had already been involved in an accident, a result similar to that of these authors.

It should be highlighted that the answers to the questions "3) Have you ever witnessed an accident with a rescue team from *SAMU Maringá/SAMU Norte Novo*?" and "4) Have you ever been a victim in an accident with a rescue team from *SAMU Maringá/SAMU Norte Novo*?" indicate that 30.2% of professionals were involved in some way in accidents with rescue teams from *SAMU* M/SNNP. At no point in this study were sleep disorders or related factors associated with accidents with *SAMU Maringá* rescue teams.

Regarding Pre-Hospital Care, Porciúncula et al.[5] point out that "pre-hospital care is based on teamwork; all first responders must be qualified and prepared to perform a set of necessary actions to provide basic support to victims of traffic accidents. The quality of care is closely related to the functioning of the team."

As for question "5) For you, what are the reasons for accidents with the rescue team during emergency care?", failures in the care protocol or in the execution of the care protocol, together, appeared in 48.84% of the answers, while failures in signaling also appeared in 48.84% of the reports, demonstrating the association between the need for training the staff of *SAMU Maringá* and need for adequate signaling during emergency care on public roads.

The "Intervention Protocols for *SAMU* 192 – Mobile Emergency Care Service"[11] provide the following measures for signaling in accidents on public roads or highways:

* Sheets BP 19, 20, 24 and 25: assistance being performed by teams of 2 or 3 professionals (first-responders);

* Sheets PE1 and PE4: security measures at the scene;

* Sheet PE 7: addresses adequate signaling depending on the speed of traffic on the road;

* Sheet PE8: refers to accidents with the ambulance.

The PHTLS[7] indicates that, for the management of patients with spinal trauma, three professionals must be present to stabilize the victim and perform maneuvers to place the stretcher under the injured patient. Even though the "Intervention Protocols for *SAMU* 192 – Mobile Emergency Care Service"[11] foresee the identification of an unsafe scene, communication with the base and requests for help from security or traffic agencies, we question the traditional model of *SAMU* Basic Support ambulances with only two rescuers, a model widely used in Brazil.

This model has been leaving a gap in the safety of the rescue team, as a third first responder would greatly contribute to signaling the scene, controlling passers-by, providing assistance to the victim, and preventing accidents with the rescue team. In this sense, it is also necessary to review whether the number of road cones available in ambulances is sufficient to signal as recommended in protocol PE 7.

Zapparoli et al.[12] cite Figueiredo et al., who report that "The prehospital care of the trauma patient is divided into three main phases: assessment of the place of care, application of protective measures for first responders, and examination/treatment of the patient. The accident scene is evaluated to guarantee the safety of the rescue team and to help the diagnosis. The place must be evaluated before the rescue team approaches the victim to assess the presence of risk situations, such as run over accidents, vehicle collisions, problems with toxic products, violence, fire and aggression". The authors also cite Cazarim et al., who state that "the first responsibility of the rescue team is to guarantee their own safety, assessing the place, determining potential risks, and providing a safe environment for people in it" and conclude that it is extremely important to identify occupational risks of the activity and adopt preventive measures to ensure the health of the worker and of the patient. This study draws attention to the rescue team who, in their eagerness to provide the best care to victims during a service on public roads, may have their health impaired or their lives taken due to an unexpected additional accident affecting the care team.

Goulart et al.[13] conducted a study with *SAMU* 192 workers in 57 cities of the State of Rio Grande do Sul, with a study population of 1352 workers, including ambulance drivers, nursing technicians and assistants, nurses and physicians. The participants reported that traffic accidents affected 8.4% of nurses, 19.5% of nursing technicians/assistants, 5.3% of physicians, 12.5% of ambulance drivers and 25% of motorcycle ambulance drivers, and run over accidents at the scene of care affected 1.2% of nurses and 1.1% of nursing technicians/assistants. In this study, 9.3% of the professionals responded positively to the question "4) Have you ever been a victim in an accident with a rescue team from *SAMU Maringá/SAMU Norte Novo*?".

Even though the present study was exploratory, the researchers encountered difficulties when proposing the theme to the municipal managers of *SAMU Maringá*. It was necessary to adapt the survey to include more generic questions to get past the initial rejection of the first research proposal. Therefore, it was not possible to obtain details on the type and circumstances of the accidents experienced by the *SAMU Maringá* rescue teams.

The results presented in this study, as well as the results of Goulart et al.[13] and Mendonça et al.[14], demonstrate the need to tackle the issue and develop strategies for training professionals and preventing work accidents with the Rescue Teams of *SAMU Maringá* during assistance on public roads.

The *SAMU Maringá* professionals who participated in the survey presented their suggestions to improve the prevention of accidents with the rescue teams during assistance on public roads. Among the suggestions, team training appeared in first place, followed by awareness of the population, adjustment of signaling and support from security agencies.

Thus, reinforcing training on measures to prevent accidents on public roads, reviewing service protocols, having an adequate supply of signaling devices, such as cones and tape rolls, and having support from security agencies appeared in the results of this research as important measures to be implemented in the *SAMU* M/SNNP in order to maintain excellence in care for victims and protecting the rescue teams.

Hung et al.[15] state that the Sendai Framework for Disaster Risk Reduction 2015–2030 placed human health at the centre of disaster risk reduction, calling for the global community to enhance local and national health emergency and disaster risk management. The Sendai Framework, published in 2019, describes the functions required for comprehensive disaster risk management

across prevention, preparedness, readiness, response, and recovery to improve the resilience and health security of communities, countries, and health systems.

CONCLUSION

This research allowed understanding the perception of the team of professionals working in SAMU M/SNNP on the possible factors associated with accidents with rescue teams, indicating the need for adequate signaling and isolation of accident scenes and continuing training for the protection of the rescue team during pre-hospital care on public roads.

Participation of the Authors: *Sueli Afonso Corrêa* – Project, literature review, data collection, data analysis, writing. *Bruno Cesar de Andrade* – bibliographic review, data analysis, writing. *Carlos Edmundo Rodrigues Fontes* - data analysis, writing. *William César Cavazana* - Project, data analysis, writing.

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