



PROFILE, EVOLUTION AND OUTCOME OF PATIENTS SERVED BY THE MOBILE EMERGENCY CARE SERVICE¹

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ABSTRACT

Objective: to analyze the profile, the evolution and outcome of patients served by the SAMU 192. **Method:** cross-sectional, exploratory and descriptive study. The sample consisted of data from 600 adult patients, served in the year 2015 by the SAMU and referred to another health service. Descriptive analysis was performed to identify the population profile, the evolution and the intra-hospital outcome; correlation testing between response time in the pre-hospital service and length of stay; and multiple logistic regression between response time and outcome. It used $p < 0.05$ as the significance level. **Results:** there was a predominance of care for clinical occurrences, male gender and average age of 55.5 years. After pre-hospital care, 50.2% of the surveyed patients remained under observation and 34.8% required hospitalization. The pre-hospital response time was positively correlated with the length of stay. The main outcome was medical discharge, with 41% of them being referred for the continuity of treatment. **Conclusion:** the analysis showed a profile of care provided to patients with an average age of 55 years and suffering from clinical diseases that required referral to a health unit, remaining under hospital observation for up to 12 hours. These results are important for the support of care flow protocols in the RUE, in order to reduce the overload of tertiary services.

Keywords: Continuity of Patient Care. Nursing. Health Services Research. Emergency Medical Services.

INTRODUCTION

The Brazilian Unified Health System (SUS, as per its Portuguese acronym) ensures access to health services at all levels of care in an integrated way and following an increasing level of services for dealing with complexities. The care in the context of the Health Care Networks (HCN) improves health outcomes in chronic conditions, reduces referrals to specialists and hospitals, increases effectiveness and solvability, besides increasing user satisfaction scores⁽¹⁾.

The Mobile Emergency Care Service – SAMU 192, as per its Portuguese acronym, is the mobile component of the Urgent and Emergency Care Network (RUE, as per its Portuguese acronym) in Brazil. It is responsible

for the articulation between health services and their points of care through their Urgent Regulation Centers⁽²⁾; its purpose is to provide early care to the patient after he/she has suffered an injury to his/her health regardless of gender, age or nature; it offers care at the place where the patient is, and adequate transport, when necessary, to a health service integrated to the SUS. Accordingly, its mission is to reduce suffering, sequels and even deaths caused by delayed care⁽²⁾.

The Basic Life Support (BLS) and Advanced Life Support (ALS) teams are monitored by the Urgent Regulation Centers, considered observatories of the health system. They have professionals trained to regulate emergency calls, through a classification and prioritization

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of needs, establishing an organization of urgent flows. In addition, they constitute an important tool for managing and ensuring access to patients^(2,3).

In this context, the SAMU 192 plays an important role in public health, since urgent and emergency situations are daily observed in the general population, with a significant increase in services resulting mainly from the epidemiological and demographic transition the country is going through⁽¹⁾. Thus, by sending ambulances with trained and qualified health teams, it can contribute to significantly reduce the rate of early deaths^(2,4). Nevertheless, it can be seen that the amount of research produced in this setting is specifically to identify the profile of the served population, the interventions carried out “*in loco*” and the knowledge and work of professionals in this area^(5,6).

Research on the evolution of patients served in the pre-hospital service until its outcome in the intra-hospital setting is still scarce. A national study, with the objective of evaluating the quality of care provided by the SAMU in the northeast of the country, used Donabedian's proposal as a theoretical reference, based on the evaluation of the “structure, process and result” dimensions. However, the “outcome” dimension was not evaluated in the research, but the authors referred to this step as essential to broadly identify the quality of care provided to patients in urgent situations⁽⁷⁾.

The aforementioned factor makes this present investigation extremely relevant, since it also makes it possible to identify the evolution and outcome of patients in the intra-hospital environment. Furthermore, the articulation and the communication of those involved in this process are essential for the excellence of care and favor the continuity of the patient in the RUE^(5,6,8).

Since SAMU 192 is an observatory of the entire HCN, characterizing the patient seen in an emergency situation, as well as its evolution and outcome in the intra-hospital environment, can contribute to the organization and the articulation of services, as well as to the improvement of care provided to these patients, in order to qualify urgent care, reduce the length of hospital stay and improve rehabilitation prognoses⁽⁴⁾.

Supported by a care model based on Care Networks, which clarifies the importance of the theme, the question is: what is the profile, the evolution and the intra-hospital outcome of patients served by the SAMU 192? This study becomes relevant for the SAMU 192 to consolidate itself as a structuring strategy for the SUS, a component of an integrated urgent care policy, and not just as a high-visibility service.

Accordingly, the objective of the study is to analyze the profile, the evolution and the outcome of patients served by the SAMU 192.

METHOD

This is a cross-sectional, exploratory and descriptive study, conducted at the Urgent Regulation Center of the SAMU 192, located in the countryside of São Paulo, and at the Referenced Emergency Room (PSR, as per its Portuguese acronym) of the region.

The SAMU 192 is regional and has a Regulation Center that currently serves the municipalities of Botucatu, Areiópolis, Anhembi and Pardinho. The Urgent Regulation Center is located in the city of Botucatu and receives all calls made by this regional health administration. It is noteworthy that this research was held only with patients served in the city of Botucatu⁽⁹⁾.

The PSR is linked to a Clinical Hospital (HC, as per its Portuguese acronym), which is responsible for the care of, at least, 68 municipalities in the region. It has a unified electronic medical record with the Municipal Adult Emergency Room (PSA, as per its Portuguese acronym) and Maternity.

The sample consisted of data from 600 patients, aged 18 or over, treated by the SAMU 192 and referred to another component of the RUE in the municipality. It was calculated based on the number of visits conducted in the first three months of 2015. The exclusion criteria were adopted for patients served by the SAMU 192 and released on site, as well as for those who died during pre-hospital care, i.e., who were not referred to another health service.

Data collection was performed in a sequence of 12 cross sections, one each month in 2015, with 25 patients per month, per type of ambulance, and the city currently has one team of ALS and one of BLS professionals.

Data were collected by the researcher herself through the SAMU 192 service record forms and the patient's intra-hospital electronic medical chart to characterize the profile and the evolution, i.e., the flow of intra-hospital care after the first service at the emergency room. The outcome was also included, being considered in this study as discharge, death or withdrawal. Data were transferred to a Microsoft Excel® spreadsheet, constituting the researcher's database. Statistical analysis was performed using SPSS 21.0® software.

The studied variables related to the profile were: patient's gender and age, variables of the patient's health history (comorbidities and risk factors), characterization of the nature of the occurrence (clinical, traumatic, psychiatric, gynecological-obstetric), main complaint and response time (time elapsed from the request for help until the arrival of the ambulance for care "in loco"); those related to the evolution were: health care facility to which patients were referred after care at the SAMU 192 (PSR, PSA and Maternity), site to which patients were referred after the first services in the intra-hospital emergency room (Orientation, Observation, Hospitalization, ICU/SU) and length of hospital stay; and those related to the

intra-hospital outcome were: outcome (discharge/death/withdrawal) and referral to another health service after hospital discharge (no/yes/site).

Data were processed using descriptive statistics (measures of central tendency) to identify the profile of the served population, the evolution and the intra-hospital outcome. Correlation testing was done between pre-hospital response time and length of stay, as well as multiple logistic regression between pre-hospital response time and intra-hospital outcome. In this study, $p < 0.05$ was considered as the significance level.

The study was approved by the Research Ethics Committee of the Botucatu Medical School, UNESP, under opinion n° 857.392, on November 3, 2014, and developed in accordance with the CONEP Resolution 466/2012.

RESULTS

It was found that, in 2015, the SAMU 192 served mostly men (51.7%) and patients with an average age of 55.5 years, with a minimum age of 18 years and a maximum of 104 years (± 21.4). The data contained in Tables 1 and 2 show the profile of the studied sample.

Table 1. Characterization of the sample as to age. Botucatu, 2015 (n=600)

Age	Average	Min.	Max.
Advanced Life Support	57.6	18	104
Basic Life Support	53.4	18	104
Total	55.5	18	104

Source: Designed by the authors.

Table 2. Profile of patients served in the mobile pre-hospital service, according to gender, nature of the occurrence, intra-hospital flow and outcome. Botucatu, 2015 (n=600)

Variables	Frequency	%
Gender		
Male	310	51.7
Female	290	48.3
Nature		
Clinical	480	80
Traumatic	64	10.7
GO*	28	4.7
Psychiatric	28	4.7
Destination site		
PSR**	431	71.8
PSA***	138	23
Maternity	31	5.2
Intra-hospital flow		
Observation	301	50.2
Hospitalization	181	30.1
Orientation	90	15
ICU/SU****	28	4.7

To be continued...

Outcome		
Discharge	511	85.2
Death	58	9.7
Withdrawal	31	5.2
Referral to the HCN****		
No	354	59
Yes	246	41

Source: Designed by the authors.

Caption: *Gynecological-obstetric; **Referenced Emergency Room; ***Adult Emergency Room; ****Intensive Care Unit/Specialized Units (Coronary Unit or Stroke Unit); *****Health Care Networks.

With regard to chronic diseases and pre-existing risk factors in this population, 43.5% were hypertensive, 33.5% smokers, 22% were alcoholics and 13% were dyslipidemic. Moreover, 19.8% of the surveyed patients had type II diabetes mellitus, 16.8% diseases related to the cardiocirculatory system and 11.8% diseases related to the respiratory system.

The clinical occurrences prevailed in 80% of the visits, with the clinical complaint "dyspnea" being the most reported (13.3%), followed by "chest pain" (12.2%), "seizure" (9.8%) and "general malaise" (6.7%). In the traumatic occurrences, "traffic accidents" (3.5%) and "falls from height" (2.8%) were predominant. As for the occurrences of a gynecological-obstetric nature, "labor", with 3.7%, and psychiatric, mainly, "psychomotor agitation", with 3.8%.

The average response time, elapsed between the request for help and the arrival of the specialized team at the place of care, was 11 minutes and 30 seconds, with a median of 8 minutes, with no statistically significant difference between the two types of vehicles.

Concerning the length of hospital stay, the data showed that, of the patients who were under observation, 36% remained in the Referenced Emergency Room for a period of 1 to 6 hours; 15% from 6 to 12 hours; 9% from 12 to 18 hours; 4% from 18 to 24 hours; and 32.8% for more than 24 hours. For patients who were admitted to the HC, the average number of days of hospitalization was 9 days, with a minimum of 1 day and a maximum of 90 days (± 11.13).

Table 3. Correlation analysis between response time and length of stay. Botucatu, 2015.

	Response time	
	R	p
Length of stay	0.45	<0.001

* Correlation analysis

From the data shown in Table 3 ($r=0.45$ ($p<0.001$)), it is observed that, when the response time increases, the patient's length of stay also increases. On the other hand, through multiple logistic regression, it was found that the increase in response time did not show a statistically significant association with the patient's outcome ($OR=0.95(0.90-1.00)$, $p=0.059$).

DISCUSSION

This study found that most patients served by the SAMU 192 were mainly referred to a Referenced Emergency Room in the region, and then cared for there, but 65% of them did not require hospitalization. The longer the response

time of the mobile pre-hospital service, the longer was the hospitalization time.

The studied sample showed a homogeneity of the care profile related to gender. Nevertheless, occurrences of male patients prevailed, a characteristic also found in other studies in the South and North of the country⁽¹⁰⁻¹²⁾.

This result is important for the development of public policies aimed at the local reality, as well as for the formulation of health promotion and disease prevention actions, thus meeting the real needs of the population⁽¹³⁾.

In addition, it is known that women are the main users of the SUS⁽¹⁴⁾, which may reflect the estimates of the Brazilian Institute of Geography and Statistics (IBGE, as per its Portuguese acronym), which indicates a higher crude mortality rate in males compared to females, as

well as premature mortality from chronic non-communicable diseases (NCDs)^(15,16).

Adding to this, the average age of the population was 55.5 years old and the prevalence of visits happened in the range of 41 to 60 years of age. Studies have also highlighted the visits of younger populations, aged from 20 to 59 years, as well as elderly people aged from 71 to 80 years^(3,6-8).

Despite variations in the age of those served in different regions of the country, there is evidence of a predominance of care focused on people of working age, i.e., those who are able to work or develop some productive activity, and on elderly people. Thus, considering the social and economic cost of this reality, the importance of early care at the site of occurrence should be reaffirmed, in order to reduce sequels and deaths related to the delay in care.

The profile of care related mainly to gender, age and nature of the occurrences has remained the same over the years, and this can be observed in other investigations conducted with this population, thus reaffirming the reality of the service and also effective actions throughout the Network that are reflected in the reduction of complications^(17,18).

The main clinical complaints (dyspnea, chest pain, seizures and general malaise) were also highlighted as the most prevalent clinical complications in the mobile pre-hospital care, in a national and international context^(12,19-20). They meet the signs and symptoms of chronic diseases and risk factors most cited in the studied sample, which were: type II diabetes mellitus, diseases related to the cardiovascular, cerebrovascular and respiratory systems, systemic arterial hypertension (SAH), smoking, alcoholism and dyslipidemia.

According to the WHO, the main chronic diseases include cardiovascular diseases, cancer, chronic respiratory diseases (asthma and COPD) and diabetes. These are responsible for more than 70% of all deaths worldwide, with three quarters of the deaths occurring in low- and middle-income countries, including Brazil, and have a disabling economic impact⁽²¹⁾.

In this study, diabetes was the main chronic disease of the analyzed patients. The prevalence of DM in Central and South American countries was estimated to be 26.4 million people and

projected to be 40 million by 2030. In European countries and in the United States of America, this increase will occur especially in the older age groups, while in developing countries it will occur in all age groups, with a threefold increase in the 45 to 64-year-old group. Its complications, whether acute or chronic, cause high morbidity and mortality, resulting in high costs to the health system⁽²²⁾.

Arterial hypertension, present in 43.5% of the study population, in addition to being a treatable disease, can be measured clinically. Smoking, the second main risk factor in the studied sample, is considered the main cause of preventable death and is directly related to the onset of chronic diseases such as cancer, cardiovascular diseases and lung diseases⁽²³⁾.

These diseases are a direct consequence of accelerated urbanization, progressive increase in life expectancy, change in dietary patterns, sedentary lifestyle, among other factors. Thus, the importance of monitoring patients with these diseases, alignment and articulation of services and public policies for prevention and adequate treatment should be highlighted⁽²²⁾.

Regarding the response time, the average time elapsed from the call and the arrival of the ambulance for the provision of care was 11 minutes and 30 seconds. The description of the response time varies in the literature from 8.6 minutes to 31.11 minutes^(19-20,24). This response time is characterized by the Brazilian Ministry of Health as an indicator of service performance and has been identified as a predictor of patient survival, since one of the basic premises of the mobile pre-hospital care is to arrive early at the scene of the occurrence in order to intervene, in the shortest time possible, with the purpose of reducing sequels and preventable deaths⁽²⁾.

A study conducted in Beijing, China, evaluating the response time of the pre-hospital service from 2008 to 2017, found an increase from 19.18 minutes, in 2008, to 22.26 minutes, in 2017, with 10% of the occurrences being met in 8.13 minutes and 90% of them in 43.35 minutes⁽²⁰⁾.

Some studies that address the quality of pre-hospital care use response time as one of the indicators of performance evaluation^(3,12,19-20,24). Nonetheless, it is necessary to consider the context of the organization of the services, the

geographical differences, the location and availability of ambulances, the delay in data recording, the time spent during medical regulation and traffic congestion. Other factors can reduce the time, such as the decentralization of the bases and the georeferencing of services, and this time may differ from one service to another⁽¹⁹⁾.

The main entrance door of the patients was the Referenced Emergency Room. At this site, half of the patients remained under observation, i.e., they were not referred for admission to any sector of the hospital unit. Most of them (36%) stayed from 1 to 6 hours in the hospital environment before being discharged.

It is noteworthy here that 15% of the surveyed patients received medical advice about their health condition before hospital discharge, with no need to remain under clinical observation, which requires improvements in the care provided to them in Primary Care, which is mainly responsible for the prevention of diseases and health promotion for these patients⁽²⁵⁾.

Another point to be discussed about this result is the screening and classification of severity by the pre-hospital mobile emergency service. In a study aiming to analyze the pertinence of calls made by the obstetric population using the SAMU 192, it was found that the referral of patients to the reference hospital was excessive and considered, as a cause of this event, the possible insecurity of the regulator physician and other professionals from the SAMU 192, entailing unnecessary referrals and the lack of effective HCN in the municipality of the study⁽¹⁸⁾. In addition, there is evidence of the overcrowding of emergency services and the increase in costs to the health system⁽²⁶⁾.

Regarding patients who were hospitalized in other HC facilities (32.8%), the average stay was 9 days, similar to a study conducted in the Southeast of Brazil, with the objective of estimating the factors involved in prolonged hospital stay of patients admitted to the emergency room, which highlighted an average hospital stay of 8.1 days and a maximum of 47 days⁽²⁷⁾.

In this research, the response time showed a positive correlation with the length of stay, corroborating the National Policy for Urgent

Situations, where it is considered a predictor of survival. Even though it has not shown a statistically significant association with the patient's outcome, it is known that the prolonged length of stay is directly related to the occurrence of adverse events and the percentage of deaths⁽²⁷⁻²⁹⁾.

Knowing about the factors involved in the response time and its consequences on the patient's prognosis allows the identification of failures to improve the quality of the service provided in all spheres of care.

The main outcome of patients referred by the SAMU 192 was medical discharge (85%) and 9.7% progressed to death. The studies found in the literature on the outcomes of patients served in the mobile pre-hospital care refer to specific interventions performed during the health care. One can mention, among others, the care of patients with septic shock⁽³⁰⁾, hypothermia after cardiac arrest⁽³¹⁾ and survival after cardiac arrest⁽³²⁾. All of them associate patient survival with interventions performed in the pre-hospital environment, leaving a gap of evidence as to the evolution of the served patients and the outcome in the hospital environment.

Of the patients who were discharged from the hospital, 40% were referred to another health service for the continuity of care. Of these referrals, 45% were related to patients who remained in observation, mostly those who stayed from 1 to 6 hours in the PSR. It can be assumed that the patients were served, evaluated and treated in their acute phase and, not needing hospitalization, were discharged with a letter of referral to another health service for the continuity of treatment.

The accomplishment of the counter-referral favors the reduction of referrals to the tertiary service without need or criteria, since there is a follow-up of the recommended therapy and a better resolution of the individual's health problem, thus preventing the worsening of his/her conditions⁽³³⁾. The articulation among services is essential for the quality of care, providing more resolute and safer referrals. Another premise is that good communication among health professionals working in the HCN is fundamental for the excellence of the care provided and continuity of care^(13,33).

It is suggested to insert their own referral and counter-referral forms in the intra-hospital electronic medical record, and even a unified and integrated electronic patient record system throughout the municipality's care network, with the purpose of improving communication among teams, reducing duplication of procedures and ensuring integrality and continuity of patient care⁽³³⁾.

As a limitation of the study, it is revealed that the follow-up of patients served in the mobile pre-hospital context was performed in only one municipality in the regional health administration and the results cannot be generalized, as well as difficulties in data collection, since they are secondary data identified by other professionals. Nevertheless, it is noteworthy that the researcher made an effort to seek the necessary information and all of it was collected.

It is estimated that more studies are addressing this issue in order to improve the flow and continuity of patient care in the RUE.

CONCLUSION

From the studied sample, it can be concluded that, in 2015, the SAMU 192 in the countryside of São Paulo mainly served male patients. The average age was 55.5 years and the population was affected by clinical problems, especially

dyspnea, chest pain and seizures, with an average response time of 11 minutes and 30 seconds.

After pre-hospital care, the patients were mostly referred to the Referenced Emergency Room in the region and half of them remained under observation, most of them for a period of up to 12 hours. Of the patients who were admitted to the Clinical Hospital facilities, the average length of stay was 9 days. It was observed that the longer the pre-hospital response time, the longer the hospital stay. Medical discharge was the most prevalent outcome, where 41% of the surveyed patients received a referral to continue their treatment in another health service of the HCN.

The importance of strengthening Primary Care should be highlighted, as a component of the RUE responsible for the prevention of diseases and health promotion for patients, and the improvement in screening and classification of severity by the mobile pre-hospital emergency service.

The accomplishment of studies such as this one helps to characterize the profile of patients inserted in the RUE and point out possible gaps in the care network that may impair the continuity and the integrality of care, aiming at the development of public policies and health actions consistent with the identified needs.

PERFIL, EVOLUÇÃO E DESFECHO DOS PACIENTES ATENDIDOS PELO SERVIÇO DE ATENDIMENTO MÓVEL DE URGÊNCIA

RESUMO

Objetivo: analisar perfil, evolução e desfecho dos pacientes atendidos pelo SAMU 192. **Método:** estudo transversal, exploratório e descritivo. A amostra constou de dados de 600 pacientes adultos, atendidos no ano de 2015 pelo SAMU e encaminhados para outro serviço de saúde. Realizou-se análise descritiva para identificar o perfil da população, a evolução e o desfecho intra-hospitalar; teste de correlação entre o tempo resposta no serviço pré-hospitalar e o tempo de internação; e regressão logística múltipla entre o tempo resposta e o desfecho. Utilizou-se $p < 0,05$ como nível de significância. **Resultados:** predominaram o atendimento de ocorrências clínicas, o sexo masculino e a média de idade de 55,5 anos. Após o atendimento pré-hospitalar, 50,2% dos pacientes permaneceram em observação e 34,8% precisaram de internação hospitalar. O tempo resposta pré-hospitalar apresentou correlação positiva com o tempo de internação. O principal desfecho foi a alta médica, sendo que 41% deles foram encaminhados para continuidade do tratamento. **Conclusão:** a análise mostrou um perfil de atendimentos a pacientes com idade média de 55 anos e acometidos por doenças de natureza clínica que necessitaram de encaminhamento a uma unidade de saúde, permanecendo em observação hospitalar por até 12h. Esses resultados são importantes para o embasamento de protocolos de fluxo assistencial na RUE, a fim de diminuir a sobrecarga dos serviços terciários.

Palavras-chave: Continuidade da Assistência ao Paciente. Enfermagem. Pesquisa sobre Serviços de Saúde. Serviços Médicos de Emergência.

PERFIL, EVOLUÇÃO Y DESENLACE DE LOS PACIENTES ATENDIDOS POR EL SERVICIO DE ATENCIÓN MÓVIL DE URGENCIA

RESUMEN

Objetivo: analizar el perfil, la evolución y el desenlace de los pacientes asistidos por el SAMU 192. **Método:** estudio transversal, exploratorio y descriptivo. La muestra estuvo compuesta por datos de 600 pacientes adultos, atendidos en el año 2015 por el SAMU y encaminados a otro servicio de salud. Se realizó un análisis descriptivo para identificar el perfil de la población, la evolución y el desenlace intrahospitalario; prueba de correlación entre tiempo de respuesta en el servicio prehospitalario y duración de la hospitalización; y regresión logística múltiple entre el tiempo de respuesta y el desenlace. El nivel de significación utilizado fue $p < 0,05$. **Resultados:** predominaron la atención a los casos clínicos, el género masculino y la edad promedio de 55,5 años. Después de la atención prehospitalaria, el 50,2% de los pacientes permaneció en observación y el 34,8% necesitó hospitalización. El tiempo de respuesta prehospitalaria se correlacionó positivamente con la duración de hospitalización. El desenlace principal fue el alta médica, con un 41% de ellos encaminado para la continuidad del tratamiento. **Conclusión:** el análisis mostró un perfil de atención a pacientes con edad promedio de 55 años y afectados por enfermedades clínicas que requirieron encaminamientos a una unidad de salud, permaneciendo en observación hospitalaria hasta 12h. Estos resultados son importantes para el establecimiento de protocolos de flujo asistencial en la RUE, con miras a reducir la sobrecarga de los servicios terciarios.

Palabras clave: Continuidad de la Atención al Paciente. Enfermería. Investigación sobre Servicios de Salud; Servicios Médicos de Urgencia.

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