CHARACTERIZATION OF THE URGENCY MOBILE SERVICE (*SERVIÇO DE ATENDIMENTO MÓVEL DE URGÊNCIA, SAMU*) FOR CLINICAL EMERGENCIES

CARACTERIZAÇÃO DO ATENDIMENTO DO SERVIÇO DE ATENDIMENTO MÓVEL DE URGÊNCIA (SAMU) ÀS EMERGÊNCIAS CLÍNICAS

CARACTERIZACIÓN DE LA ATENCIÓN DEL SERVICIO DE ATENCIÓN MÓVIL DE URGENCIAS (SAMU) PARA EMERGENCIAS CLÍNICAS

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ABSTRACT

Objectives: to characterize the clinical care provided by SAMU of Salvador. **Methodology:** this is a descriptive, exploratory and cross-sectional study whose sample consisted of 465 records of clinical care performed by the SAMU, in the city of Salvador, Bahia. Data was obtained through a data collection instrument and descriptive analysis was performed with the SPSS software, in which relative and absolute frequencies were processed. **Results:** the patients attended were characterized by being men (49.9%) with a mean age of 54 years old [Standard Deviation (SD)=21)]. Neurological (36.1%), cardiac (14.4%) and respiratory (12.9%) injuries were prevalent. Basic support units were the most triggered (63.7%) and their main outcome was on-site care and removal to a reference hospital (21.7%); however, resources such as oxygen therapy and venipuncture were not used in most calls. The mean time between the opening of the occurrence and the output was 22 minutes (SD=20). The mean response time was 39 minutes (SD=25) and the total mean duration of occurrence was two hours (SD=1:23). **Conclusion:** SAMU clinical consultations occur predominantly with men and neurological disorders. Disagreement was identified between the patients' need and the dispatching of resources, according to the team's evaluation. The times involved in pre-hospital care are high.

Keywords: Emergency Medical Services; Ambulatory Care; Emergency Nursing; Medical Care; Nursing Research.

RESUMO

Objetivo: caracterizar os atendimentos clínicos realizados pelo SAMU de Salvador. Metodologia: trata-se de estudo descritivo, exploratório e transversal cuja amostra foi composta de 465 fichas de atendimentos clínicos realizados pelo SAMU, na cidade de Salvador na Bahia. Os dados foram obtidos por meio de instrumento de coleta de dados e a análise descritiva realizada com o software SPSS, no qual foram processadas frequências relativas e absolutas. Resultados: os usuários atendidos se caracterizaram por serem homens (49,9%) com média de idade de 54 anos [desvio-padrão (DP)=21]. Os agravos neurológicos (36,1%), cardiológicos (14,4%) e respiratórios (12,9%) foram prevalentes. Unidades de suporte básico foram as mais acionadas (63,7%) e tiveram como principal desfecho o atendimento no local e remoção para um hospital de referência (21,7%), no entanto, recursos como oxigenoterapia e punção venosa não foram utilizados na maior parte dos atendimentos. A média de tempo entre a abertura da ocorrência e saída da base foi de 22 minutos (DP= 20). O tempo resposta teve média de 39 minutos (DP= 25) e a duração total média da ocorrência foi de duas horas (DP= 1:23). Conclusão: os atendimentos clínicos realizados pelo SAMU ocorrem prevalentemente com homens e por agravos neurológicos. Identificou-se discordância entre a necessidade dos pacientes e o envio de recursos, mediante a avaliação da equipe. Os tempos implicados no atendimento pré-hospitalar são elevados.

Palavras-chave: Serviços Médicos de Emergência; Assistência Ambulatorial; Enfermagem em Emergência; Cuidados Médicos; Pesquisa em Enfermagem.

RESUMEN

Objetivo: caracterizar la atención clínica brindada por el SAMU de Salvador. Metodología: estudio descriptivo, exploratorio y transversal cuya muestra consistió en 465 registros de atención clínica realizadas por el SAMU, en la ciudad de Salvador, Bahía. Los datos se obtuvieron mediante un instrumento de recogida datos y un análisis descriptivo realizado con el software SPSS, en el que se procesaron las frecuencias relativas y absolutas. Resultados: los usuarios atendidos se caracterizaron como varones (49,9%) con edad media de 54 años [desviación estándar (DP) = 21)]. Prevalecieron los problemas neurológicos (36.1%), cardíacos (14.4%) y respiratorios (12.9%). Las unidades de apoyo básicas fueron las más necesitadas (63,7%) y su resultado principal fue la atención in situ y el traslado a un hospital de referencia (21,7%); sin embargo, en la mayoría de los casos, no se utilizaron recursos como la oxigenoterapia y la punción venosa. El tiempo promedio entre la apertura del incidente y la salida de la base fue de 22 minutos (DP = 20). El promedio del tiempo de respuesta fue de 39 minutos (DP = 25) y la duración total promedio del incidente fue de dos horas (DP = 1:23). Conclusión: las casos clínicos atendidos por el SAMU ocurren básicamente entre hombres y por problemas neurológicos. Se identificó un desacuerdo entre la necesidad de los pacientes y el envío de recursos, de acuerdo con la evaluación del equipo. Los tiempos de atención prehospitalaria son elevados.
Palabras clave: Servicios Médicos de Urgencia; Atención Ambulatoria; Enfermeria de Urgencia; Atención Médica; Investigacion en Enfermeria.

INTRODUCTION

Patients affected by acute or chronic clinical problems need early and qualified health care. To address the health demands in urgent and emergency situations, patients look for health services, including mobile pre-hospital care services.[1]

The mobile pre-hospital service in the emergency area must respond early to the victim, after a health event that causes suffering, sequelae or death has occurred, being necessary to provide appropriate care and or transportation to a properly hierarchized health service and integrated into the Unified Health System (*Sistema Único de Saúde*, SUS).[2]

In addition, the Urgency and Emergency Network (*Rede de Urgência e Emergência*, RUE) was implemented to expand access and improve the quality of health care, in order to articulate the different services, presenting a counterpoint to hierarchical access to SUS. Thus, the composition of the RUE is characterized by services with various technological densities, such as: primary care; promotion actions, health prevention and surveillance, SAMU, stabilization room, 24-hour emergency care units (ECUs 24h), hospital care and home care. [3]

In Brazil, the SAMU is the mobile component of the Urgency and Emergency Network. Its purpose is to receive medical help requests from citizens affected by acute illnesses aiming at reducing the sequelae caused by the delay in care, time of hospitalization and the number of deaths.[3]

The rapid and disordered growth of cities has led to important epidemiological changes. In accordance with this reality, there is an increase in chronic diseases in the country, especially those related to the circulatory system.[3] It is estimated that 17.7 million people died from cardiovascular disease in 2015, representing 31% of the global deaths.[4] As a result, in recent years, several countries have developed services and systems that meet this demand. In view of this reality, the Ministry of Health established in 2011 the cardiovascular care line, focusing on Acute Myocardial Infarction (AMI), and the Cerebrovascular Care Line, aiming at the attention to stroke.[3]

The doors of urgency and emergency rooms can be important markers of the quality of the health condition of the population, as well as reflect the performance of the health system. Also, through them, it is possible to identify the health problems of the population or the recurrent diseases, such as the high incidence of AMI in a given region. Therefore, the characterization of clinical diseases makes it possible to deepen issues that are still little explored in the performance of mobile pre-hospital care in emergency, since most studies have been dedicated to traumatic events, especially traffic.[1,5]

Given the above, the article aims to characterize the clinical care provided by the SAMU in Salvador.

MATERIAL AND METHODS

This is a documentary, exploratory, cross-sectional, and retrospective study with a quantitative approach, conducted in the city of *Salvador* – BA. The SAMU service records generated in 2015 were used, being a clipping of a matrix project entitled "*Perfil de atendimento do Serviço de Atendimento Móvel de urgência na cidade de Salvador/BA*"/"Service profile of the Mobile Emergency Care Service in the city of Salvador/BA".

The municipality of *Salvador*, located in the coastal region of the state, occupies a territorial extension of 693.3 km² and its political-administrative organization comprises 12 health districts. The estimated population of Salvador in 2013 was 2,883,682 inhabitants, 47% male and 53% female.[6]

Salvador was elected by the *Ministério da Saúde* (BR)/Ministry of Health as one of the Northeast's pole cities for implementation and structuring of SAMU – 192, the emergency medical regulation centers and the training center for continuing education in urgencies, considering aspects such as: accidents due to landslides and flooding; large movement of the road system and traffic accidents; predominantly low-income population without private health plans and with difficulty in moving to medical care; overcrowding in hospital emergencies; lack of ambulances; estimated incidence of AMI – 99/100,000 adults; existence of high and medium complexity services, beds necessary for the establishment of referral and counter-referral of patients in the various care components.[7]

Salvador's SAMU-192 has a metropolitan nature only for the operation of the emergency medical regulation center. Thus, the agreed cities have administrative autonomy, their own staff and records file archiving.

For the project matrix, the sample size calculation starting with the population of 14,400 records to a confidence level of 99% and an error margin of 5%, it would take 637 medical records. In order to obtain two records from each day of the year, 730 records were selected by lot and collected between the months of March and July 2016. The records that did not mention the reason for the call and the service times were not included, so we replaced them. Among these, for this study, 485 records related to clinical care were selected. The following is the data collection flowchart, in Figure 1:

The data collection instrument included the following variables: age, gender, health district, type of unit sent, use of material resources, performing invasive procedures, agreement between the information provided and the finding of the team in *loco*, type of clinical problem attended (system affected), outcome of the assistance, type of trigger (1. screening – when the ambulance crew is only triggered after screening of the call by the medical regulator and 2. automatic triggering – when the team is triggered immediately, in case of emergency or urgent priority, while the medical regulator gathers the information with the requestor), reference unit, shift and service times.

The data formed a bank in the Microsoft Excel program, being imported into the SPSS statistical package, version 20.0, in which the analyses were performed. Absolute and relative frequencies for qualitative variables, mean and standard deviation for quantitative variables were calculated.

This study met the ethical and scientific requirements contained in Resolutions N° 466/12 and 510/16 of the Conselho Nacional de Saúde. The research project was authorized by the Ethics Committee of the *Faculdade de Medicina* of the *Universidade Federal da Bahia*, approved with Opinion number 1,606,525.

RESULTS

The characterization of the demographic data regarding the 465 clinical occurrences is presented in Table 1. Regarding age, the age group from 19 to 59 years old (48%) predominated, followed by 60 years old or more (42.4%). Patients had a minimum age of three years old and a maximum of 100 years old, with a mean age of 54.29 (± 21.48).

Table 1 - Demographic characteristics and health district of the records of the patients affected by clinical problems attended by the SAMU. *Salvador/Bahia* – 2015

Sociodemographic characteristics	n (465)	%
Gender		
Male	232	49.9
Female	218	46.9
No information	15	3.2
Age		
19 to 59 years old	223	48.0
More than or equal to 60 years old	197	42.4
13 to 18 years old	20	4.3
No information	20	4.3
1 to 12 years old	5	1.1
Health district		
Barra/Rio Vermelho	68	14.6
Ferroviário Suburb	56	12.0
Cabula/Beiru	48	10.3
Itapuã	40	8.6
Historical Center	38	8.2
São Caetano/Valéria	38	8.2
Brotas	38	8.2
Liberdade	37	8.0
Itapagipe	35	7.5
Pau da Lima	27	5.8
Cajazeiras	21	4.5
Boca do Rio	19	4.1

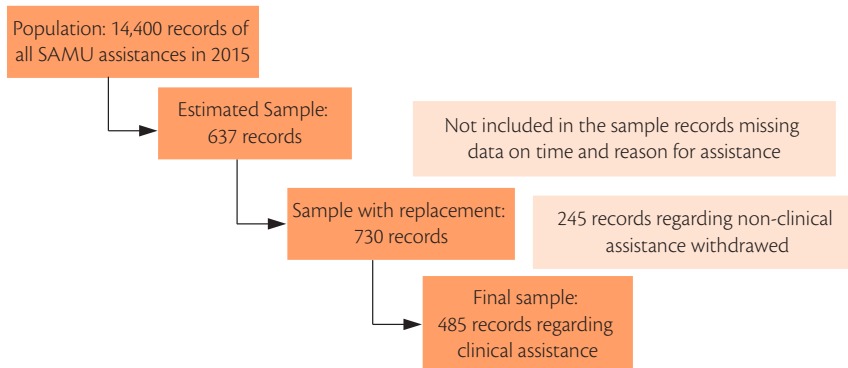Source: elaborated by the authors.

Figure 1 - Data collection flowchart.

Regarding the health district, most occurrences came from the *Barra – Rio Vermelho* district, with 14.6%, followed by 12% from the *Ferroviário* Suburb and 10.3% from *Cabula – Beiru*. The health district with the least occurrence requests were *Boca do Rio* and *Cajazeiras*, with 4.1 and 4.5%, respectively.

Table 2 presents the characterization of the systems related to the clinical problems attended by the SAMU teams. Neurological disorders were the most prevalent, with 36.1%, followed by cardiac and respiratory disorders with 14.4% and 12.9%, respectively. In addition, 40 (8.6%) occurrences were categorized as "Other" because they are nonspecific, non-serious injuries that did not fit into the other categories, 14 (3.0%) as deaths and 12 (2.6%) were categorized as cardiopulmonary arrest (CPA). In both the "death" and "cardiopulmonary arrest (CPA)" categories, the probable organic cause was not elucidated.

Table 2 - Frequency of the systems related to the clinical conditions attended from the basic complaint and the reason recorded in the medical records of patients affected by clinical conditions attended by the SAMU. *Salvador/Bahia* – 2015

Types of clinical conditions	n (465)	%
Neurological	168	36.1
Cardiological	67	14.4
Respiratory	60	12.9
Metabolic	45	9.7
Others	40	8.6
Gastrointestinal	29	6.2
Infectious	14	3.0
Death check*	14	3.0
Cardiopulmonary arrest (CPA) *	12	2.6
Musculoskeletal	8	1.7
Carcinogenic	4	0.9
Genitourinary	4	0.9
Total	465	100

* No identification of etiology.
Source: elaborated by the authors.

Regarding the agreement of the request with the real reason found by the team in the scene, 284 (61.1%) assistances were similar to the request and 94 (20.2%) were discordant. In 18.7% of the occurrences, the health team did not have access to the victim, and it was not possible to verify the agreement of the complaint with the real reason found in the scene.

In Table 3 it was identified that 296 (63.7%) clinical diseases were attended by the Basic Support Unit (BSU) and 90 (19.4%) by the Advanced Support Unit (ASU). Some occurrences (9.7%) required initial BSU assistance and later ASU support was requested. Regarding the shift of occurrences, the morning (40.4%) and afternoon (27.5%) periods predominated. The most frequent form of activation was screening (95.9%) and only 4.1% were triggered by automatic triggering.

Table 3 - Characteristics related to the care for the clinical diseases assisted according to the type of unit triggered, the service shift and the way the teams are called on to patients affected by clinical diseases attended by the SAMU. *Salvador/Bahia* – 2015

Characteristics of the clinical occurrences	n (465)	%
Type of unit triggered		
USB	296	63.7
USA	90	19.4
ASU and BSU	45	9.7
Motorcycle	17	3.7
BSU and Motorcycle	6	1.3
ASU and Motorcycle	6	1.3
ASU, BSU and Motorcycle	4	0.9
Speedboat	1	0.2
Shift		
Morning (07:00 to 12:59)	188	40.4
Afternoon (13:00 to 18:59)	128	27.5
Night (19:00 to 23:59)	85	18.3
Late night (00:00 to 06:59)	64	13.8
Type of trigger		
Screening	446	95.9
Automatic triggering	19	4.1

Source: elaborated by the authors.

Regarding the use of materials and procedures, it was observed that the resources used in the occurrences were the following: oxygen (14.6%), venous access (30.1%), intubation (2.4%), drugs (23.4%) and immobilization (4.7%). It is noteworthy that there were assistance instances that did not use resources and others that needed another resource or intervention.

Table 4 shows that in 43% (n=200) of the occurrences there was a need for on-site intervention and removal for a more complex service and that 21.3% (n=99) of the patients were attended and remained on site, without removal. Part of the assistance instances (12.3%) was canceled after the team displacement.

Table 4 - Outcomes of the occurrences of assistance to clinical conditions registered in the records of patients affected by clinical diseases attended by the SAMU. *Salvador/Bahia* – 2015

Outcomes	n (465)	%
Assisted and removed	200	43.0
Assisted and left on site	99	21.3
Assistance canceled after team trigger	57	12.3
Refusal to remove	44	9.5
Removed by third parties	22	4.7

Table 4 - Outcomes of the occurrences of assistance to clinical conditions registered in the records of patients affected by clinical diseases attended by the SAMU. *Salvador/Bahia* – 2015

Outcomes	n (465)	%
Death check*	22	4.7
Evasion	9	1.9
Refused assistance	5	1.1
Assisted by private ambulance	3	0.6
Others	3	0.6
Risk to staff/not assisted	1	0.2

* With or without the application of cardiopulmonary resuscitation.
Source: elaborated by the authors.

Of the 200 (43.0%) patients regulated/transferred after assistance by the SAMU, 101 (21.7%) were referred to a public/private hospital, 66 (14.2%) to an Emergency Care Unit (ECU), 27 (5.8%) for an Emergency Care (EC), five (1.1%) for maternity and one (0.2%) for a private orthopedic clinic.

Table 5 describes the time spent by the SAMU on the clinical events. The resulting mean time between "occurrence opening-unit trigger", "unit trigger-base exit" and "occurrence opening-base exit" was 19 minutes, three minutes and 22 minutes, respectively. The response time, which consists in the opening of the occurrence until the arrival of the SAMU at the site, averaged 39 minutes and ranged from 10 minutes to three hours. The mean time elapsed at the site of occurrence was 54 minutes and the maximum stay at the site was six hours and 41 minutes. The length of stay in the reference unit ranged from four minutes to four hours and 23 minutes, with a mean of 42 minutes. The total mean duration of the occurrence corresponded to two hours and nine minutes and the maximum time was 12 hours and 18 minutes.

DISCUSSION

Regarding the sociodemographic characteristics, it should be noted that the patients served by the SAMU were predominantly characterized by being men, of economically active age and residents of the *Barra/Rio Vermelho* health district.

The predominance of men has been highlighted in other studies with patients with clinical problems. In a 2018 study conducted in *Rio Grande do Norte*,[8] of the 138 clinical occurrences attended by the SAMU, there was a prevalence of males in 50.7%. In other studies, conducted in northern *Minas Gerais*[9] and in *Rio Grande do Sul*,[10] of SAMU's total assistances, this percentage corresponded to 55.2% and 55.9%, respectively.

This finding may be related to the fact that men are more resilient in seeking medical assistance when affected by health problems, which worsens their condition.[11]

The population of this study was concentrated in the age group of 19 to 59 years old, followed by 60 years old or older. This data was similar to the one found in another study, in which the majority of the SAMU assistance was provided to patients aged 20-60 years old (55.6%), followed by over 60 years old (24.6%), and also in the assistance to clinical diseases by the SAMU of *Porto Alegre*, whose most prevalent age group was 21 – 60 years old (42.3%), followed by those over 60 years old (35.0%).[1,9]

Most of the requests for assistance in Salvador came from the "*Barra/RioVermelho*" health district, which is the second most populous district, second only to the "*Cabula/Beiru*" district, according to the IBGE/SESAB/SMS census (2015). Regarding the Human Development Index (HDI), the district of "*Barra/Rio Vermelho*" obtained 0.773 (2017), being considered of high development, higher than the city of Salvador, which presented an HDI of 0.759 in the same period, and higher than other health districts. This data reflects the high socioeconomic and educational level of the residents of this district, which may be related to the ease of access to health services.

Table 5 - Time spent by the staff in assisting to clinical conditions recorded in the medical records of patients affected by clinical conditions treated by the SAMU. *Salvador/Bahia* – 2015

	Mean	Standard Deviation	Minimum	Maximum
Occurrence opening – unit trigger	00:19:52	00:20:07	00:01:00	02:30:00
Unit trigger – base exit	00:03:22	00:02:22	00:01:00	00:24:00
Occurrence opening – base exit	00:22:57	00:20:16	00:02:00	02:33:00
Response time *	00:39:53	00:25:43	00:10:00	03:00:00
Arrival at site – departure from site * **	00:54:21	00:48:16	00:02:00	06:41:00
Stay in the reference unit **	00:42:00	00:42:20	00:04:00	04:23:00
Total duration of occurrence *	02:09:06	01:23:16	00:16:00	12:18:00

* For the calculation of these times, the events whose outcome was the cancellation of assistance and patients that were removed by third parties were excluded.
** Only these times were considered in the calculation of auto-triggered occurrences.
Source: elaborated by the authors.

The "*Ferroviário* Suburb", the third most populous district, responded to the second highest demand of requests, which may be related to poor health conditions and higher barriers to access, thus using the SAMU as a gateway for resolution of its problems.

Among the clinical emergencies attended, the one that generated the largest number of requests were neurological disorders, followed by cardiovascular and respiratory disorders. This data is in line with other studies that obtained the same prevalence.[9,12] Cardiovascular and neurological diseases are the leading causes of death in Brazil and it is estimated that this rate will increase in the coming years, due to the aging of the population and inadequate eating habits and physical activity.[13]

Regarding the accuracy of the Regulation Central in sorting and dispatching mobile unit to meet the health situation to which it was sent, although the accuracy corresponds to more than half of occurrences, still represents a percentage below the desired, since in all occurrences resources are spent and staff is called for assistance according to clinical severity and distance from the site.

The units triggered to provide assistance to users affected by clinical diseases were mostly BSU. But these tend to be more numerous and to be located in more parts of the city, having the opportunity to reach the victims faster. These findings are similar to the study conducted in *Catanduva* – SP, where the BSU accounted for 90.0% of the assistances.[14-16] Considerable number of occurrences (9.7%) required initial assistance by BSU and later support from ASU, which may be related to the worsening of the clinical condition or the mistake or difficulty in activating the most appropriate unit to solve the problem.

Occurrences were concentrated, in descending order, in the morning shift, followed by the afternoon, night and dawn. In the studies of Casagrande *et al.*[10], in 2013, and by Lefundes *et al.*[15], in 2016, the occurrences in the afternoon period were more frequent (28.7%; 28.8%), followed almost similarly by the morning (26.1%; 28.7%), night and late night. Still in this last study, it was found that the events arising from clinical and psychiatric causes were concentrated in the morning, while those due to traumatic and obstetric causes occurred mostly in the afternoon and during the dawn, in that order.[15]

Limited use of materials and procedures were observed in occurrences assisted by the SAMU teams. This finding was also evidenced in research[10] who performed/used only 38% oxygen, 35.4% peripheral access, 4.8% intubation, 14.3% of drugs and intubation 35.3% of the total assistances performed by the SAMU of *Porto Alegre*.[10]

Limited resource use may be related to the low severity of clinical conditions, requiring less use of invasive materials and procedures; or the possible low level of confidence of medical regulators in the SAMU teams for procedure authorization, as most requests were met by a BSU team consisting of a driver and a Nursing technician. A study suggests what may justify the relatively small proportion of the use of these resources: low rate of serious victims requiring invasive procedures; the serious victims are not being treated by the ASU; or the team is not sufficiently trained and therefore does not perform invasive procedures.[10]

Intubation, in turn, a procedure always performed by the ASU team, was recorded in only 2.4% of the assistance instances, while in immobilization the reduced percentage is justified by the occurrences of clinical nature. In Northern Finland, regardless of rural or urban environment, orotracheal or supraglottic intubation devices are used in 13.3% of the patients.[13]

The main outcome of this study was on-site intervention and subsequent removal to a more complex service, in line with the 2018 study[9] and in 2013[14], in which there was a predominance of 65.43% and 64.3%, respectively. It should be noted that in these studies there were assistance instances for all types of diseases.[9,14]

In contrast, a study conducted in *Porto Alegre* revealed that 73.2% of the patients treated by the SAMU, in clinical care, were transported to a health service, but only 3.7% of these had a real emergency situation.[16] Accordingly, it emerged that clinical emergencies, compared to other types of occurrence, were those that obtained the highest percentage of users not removed at the place of assistance after intervention and team evaluation.[17]

In these circumstances, the patient is not removed due to the team finding that there has been improvement or stabilization of the health problem, thus not requiring transfer to other services of the Health Care Network and, in some cases, there is a lack of characterization of the urgency or emergency situation, which is not a health situation that justifies the request or sending of the SAMU team.[1,9] However, there may be patient refusal to be taken to another service.

Importantly, the patient can often generate a call of a clinical nature, but associated with other types of occurrence, such as traumatic or obstetric, for example, which interferes with the definition of the reference unit to which the person will be regulated.

Of the total outcomes of assistance, 4.7% of the patients were dead upon arrival of the SAMU team, a situation that may happen due to the severity of the patients, delay in the arrival of the ambulance, lack of knowledge of the population about the possibility of reversal of the clinical condition or activation of the population to verify death, because they believe that legal procedures will be faster.

Regarding the events that were canceled after the ambulance was triggered and sent (12.3%), it is presented the fact that the resource was displaced, but there was no need for assistance, being canceled by the applicant himself, removed by third parties,

Firefighters, Military Police or verified the need not to send the unit due to the addition of pertinent information about the situation of the victim that would not characterize urgent or emergency situations. In line with this information, a survey conducted in South Africa found that over 80% of the ambulance dispatches for critical cases required lower priority response, over 58% of the cases required no intervention or transport, and 36% required only BSU intervention, with significant mismatch between resource delivery and actual patient need.[18-24]

Regarding the participation of the health services as a gateway for SAMU patients, it was found that most of the removals went to hospitals, followed by the ECUs. Other authors also obtained the hospital service (47.0%) and the ECU (16.3%) as main reference units of removals, which corroborates the data analyzed in this study.[1]

Changes in the population demographic profile and morbidity and mortality due to non-communicable chronic diseases, associated with low demand, patients' access difficulties and low primary care resolution in the prevention and control of chronic diseases, have repercussions on the increased demand in pre-hospital and hospital emergency services.[18]

In this investigation, the times involved in regulation differed greatly from other studies. The mean resulting from the "occurrence opening-unit trigger" was 19 minutes. In a study carried out in *Porto Alegre*, the times used in the regulation center, from the reception of the call by the medical regulation assistant operator, to the medical regulator and ending in the radio operator, totaled 3.31 minutes.[19] A similar finding was identified in the SAMU of *Belo Horizonte*/MG, whose sum of these regulation times was 3.36 minutes.[20]

Regarding the "unit trigger-base exit" time, the mean obtained in this work was three minutes, ranging from one to 24 minutes.

A similar study points out that, in 30.1% of the assistance instances, the BSU and ASU teams leave for the event in less than a minute, while 10.8% use 1.01 to three minutes to leave; 15.4% depart between 3.01 and five minutes; 36.2% use 5.01 to 10 minutes and 7.5% leave 10 minutes after being advised about the assistance.[19]

The "occurrence opening-base exit" times were very heterogeneous and prolonged, and in 51.6% of the occurrences, the times ranged from three to 10 minutes for the teams to leave for assistance. These results contradict the SAMU readiness principle that does not seem to be sufficiently observed, otherwise the time would not extend beyond one to three minutes.[19]

The response time of this survey mean was 39 minutes and ranged from 10 minutes to three hours. The very long response time may be associated with transfer requests between fixed units. Comparatively, a study in the SAMU of *Porto Alegre*[19] found that the response time was less than 10 minutes in 9.2% of the assistance instances. From then on, in *Porto Alegre*, the times were similarly distributed: in 23.4% of the cases the response time was 10.01 to 15 minutes, while 24.2% presented 15.01 to 20 minutes; 24.6% from 20.01 to 30 minutes; 16.8% from 30.01 to 60 minutes; and 2% of the assistance instances took more than 60 minutes.[19] In addition, the estimated times involved in pre-hospital emergency care, such as response time, are indicators for understanding and evaluating services and quality of assistance provided.[25]

In an evaluation carried out in five Brazilian state capitals, the following response time means were found: *Manaus* two minutes, *Recife* 15, *Brasilia* 10, *Rio de Janeiro* nine and *Curitiba* 10 minutes. However, the authors point out that the *Manaus* data are estimates, lacking precision.[21] The SAMU of *Palmas* has a response time mean of 8.6 minutes, presenting the best *response time* compared to the literature data.[22] *São Paulo* has a mean of 27 minutes, one of the worst times in the country. And *Salvador* still has a higher response time. Overall, in Brazil there are no indicators for response time. Asia (Seoul, Taiwan, Singapore) and Africa (Ghana) can reach times under eight minutes, a globally accepted indicator.[25]

The factors related to longer response times are the following: heavy traffic, percentage of Gross Domestic Product (GDP) spent on public health, geographic density, public health policies, life expectancy and education level of the population.[25]

The length of stay in the reference unit ranged from four minutes to four hours and 23 minutes, with a mean of 42 minutes. The fragility or lack of definitions related to reference grid agreement and the lack of protocols and care line flows impose obstacles in the reception of patients at emergency doors.[21] As the emergency doors coexist with the routine of overcrowding, the difficulties in receiving users transported by the SAMU increase, which may justify the long waiting times for medical regulation and the time that pre-hospital units are held in the hospital environment waiting to be released to be available for further assistance.[1]

These conditions should be considered when evaluating the response time indicators, as these factors collaborate to keep the SAMU teams busy, causing unavailability for other demands.

Regarding the time elapsed at the place of occurrence and the total duration of the occurrence, no studies were found in the literature that discussed these time intervals so that it could be contrasted with the present work.

CONCLUSION

Clinical assistances by the SAMU *Salvador* highlight the prevalence of men and neurological causes. Inconsistencies were found in the relation between the patient's health demand, after the team assessment, and resources shifted to

the assistance. In addition, patients spent an average of two hours and nine minutes in the care of the SAMU teams.

The neurological and cardiovascular diseases that affected the sample reinforce the epidemiological profile of the population and the demand profile of the SAMU found in other studies in Brazil, considering the aging of the population and the change in the epidemiological profile.

It is considered a challenge for managers responsible for structuring, planning and qualifying the SAMU to evaluate the time spent on care, which are indicators associated with the survival of patients, especially in diseases considered time-dependent.

Because it is a descriptive study, there are related limitations, requiring more complex analyses. Still, it is imperative to deepen studies of this nature, seeking to improve indicators, which are crucial to measure service performance and quality of care.

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