

**Cardiorespiratory arrest in prehospital care**  
**Parada cardiorrespiratória no atendimento pré-hospitalar**  
**Paro cardiorrespiratorio en la atención prehospitalaria**

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Cross-sectional research with a descriptive design of a quantitative analytical approach, carried out between 2018 and 2019, using forms with registration completed by the care teams of the Advanced Support Units of São José do Rio Preto, SP, Brazil, in order to analyze the outcomes of cardiac arrest in patients in pre-hospital care. The collected and tabulated data were analyzed statistically in a descriptive and inferential manner. 291 attendance records were considered. Of the outcomes of cardiorespiratory arrest, deaths were reached in 63.92%, deaths during care in 30.24% and PCR reversed and referral to the hospital in 5.84%. The factors that most influenced deaths were: advanced age (66.66% over 71 years old), occurrence at residences (75.81%) and cardiovascular diseases (74.91%). The response time was significant in the outcome of death, as well as the initial rhythm of asystole (in 99.46% of the death reports and 70.45% of the deaths during care). The ambulance arrived at the site in 12 minutes in 76.47% of the cases. Of the reversed cardiorespiratory arrest, cardiopulmonary resuscitation was being performed (64.71%) before the Advanced Support Unit arrived. The training of the community in relation to the early recognition of cardiopulmonary arrest and the performance of cardiopulmonary resuscitation is important.

**Descriptors:** Heart arrest; Patients; Emergency medical services; Cardiopulmonary resuscitation.

Pesquisa transversal com delineamento descritivo de abordagem quantitativa do tipo analítica, realizada entre 2018 a 2019, utilizando fichas com registro preenchidas pelas equipes assistenciais das Unidades de Suporte Avançado de São José do Rio Preto, com o objetivo de analisar os desfechos de parada cardiorrespiratória em pacientes no atendimento pré-hospitalar. Os dados coletados e tabulados foram analisados estatisticamente de forma descritiva e inferencial. Considerou-se 291 fichas de atendimentos. Dos desfechos da parada cardiorrespiratória, atingiu-se óbitos em 63,92%, óbitos durante o atendimento em 30,24% e PCR revertida e encaminhamento ao hospital em 5,84%. Os fatores que mais influenciaram os óbitos foram: idade avançada (66,66% acima de 71 anos), ocorrência na residência (75,81%) e doenças cardiovasculares (74,91%). O tempo de resposta foi significativo nos desfechos de óbito, assim como o ritmo inicial de assistolia (em 99,46% das constatações de óbitos e 70,45% dos óbitos durante o atendimento). A chegada da ambulância ao local foi de 12 minutos em 76,47% dos casos. Das paradas cardiorrespiratórias revertidas, a ressuscitação cardiopulmonar estava sendo realizada (64,71%) antes da chegada da Unidade de Suporte Avançado. A capacitação da comunidade em relação ao reconhecimento precoce da parada cardiorrespiratória e a realização da ressuscitação cardiopulmonar mostra-se importante.

**Descritores:** Parada cardíaca; Pacientes; Serviços médicos de emergência; Reanimação cardiopulmonar.

Investigación transversal con diseño descriptivo de enfoque cuantitativo de tipo analítico, realizada entre 2018 y 2019, utilizando formularios con registros llenados por los equipos de atención de las Unidades de Soporte Avanzado de São José do Rio Preto, SP, Brasil, con el objetivo de analizar los resultados del paro cardiorrespiratorio en pacientes en atención prehospitalaria. Los datos recogidos y tabulados se analizaron estadísticamente de forma descriptiva e inferencial. Se consideraron un total de 291 historias clínicas. De los resultados del paro cardiorrespiratorio, el 63,92% fueron muertes, el 30,24% muertes durante la asistencia y el 5,84% PCR revertido y derivación al hospital. Los factores que más influyeron en las muertes fueron: la edad avanzada (66,66% por encima de los 71 años), la ocurrencia en el hogar (75,81%) y las enfermedades cardiovasculares (74,91%). El tiempo de respuesta fue significativo en los resultados de muerte, así como el ritmo inicial de asistolia (en el 99,46% de las muertes y en el 70,45% de las muertes durante la atención). La llegada de la ambulancia al lugar de los hechos se produjo en 12 minutos en el 76,47% de los casos. De los paros cardiorrespiratorios revertidos, la reanimación cardiopulmonar se realizaba (64,71%) antes de la llegada de la Unidad de Soporte Avanzado. Es importante la educación de la comunidad en cuanto al reconocimiento temprano del paro cardiorrespiratorio y la reanimación cardiopulmonar.

**Descriptor:** Paro cardíaco; Pacientes; Servicios médicos de urgencia; Reanimación cardiopulmonar.

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## INTRODUCTION

**C**ardiorespiratory arrest (CRA) is defined by the American Heart Association (AHA) as the “sudden and unexpected cessation of useful and sufficient ventricular mechanical activity”. It is a sudden condition, which can be reversible, if there is a prompt and effective cardiopulmonary resuscitation (CPR) maneuver<sup>1</sup>. The most common etiology of CRA is an ischemic heart disease that causes lethal arrhythmias. Sudden death is considered a relevant public health problem. Approximately two thirds of the cases would be related to coronary artery disease, occurring outside the hospital environment<sup>2</sup>. Data from the Ministry of Health show cardiovascular diseases are the most common cause of death in Brazil and a public health problem, accounting for 267,496 deaths per year<sup>3</sup>.

After CRA, patients who return to spontaneous circulation (RSC) are considered to be at very high risk, with hospital mortality rates between 63 and 90%<sup>4</sup>.

Survival from CRA presents divergent outcomes. In the out-of-hospital scenario, survival rates are 1% to 6%<sup>5</sup>. A study showed that out-of-hospital CRA had a 5% to 10% survival rate among those treated by emergency medical services, and 15% when the rhythm disorder was ventricular fibrillation (VF)<sup>5</sup>.

Epidemiological data are dissipated differently, depending on the environment of occurrence, whether extra or in-hospital<sup>6</sup>. A number of CRAs, even in countries with well-structured registries, are still unknown. It is estimated that there are between 180,000 and 450,000 deaths annually. In the United States, there are approximately 370 thousand fatal cases per year, with a survival rate of less than 15% in non-hospitalized people and 22% when hospitalized<sup>7</sup>.

There is a relationship between pre-arrest factors and survival after resuscitation<sup>8</sup>. Overall survival is 18.4%, ranging from 10.5%, when the initial detected rhythm is not shockable, and 49%, if the rhythm is shockable<sup>9</sup>. There is a 7% to 10% loss of survival probability for every minute lost in cases of CRA. On average, the survival rate is approximately 2.5% in 12 minutes. These facts demonstrate that the immediate identification of CRA and the beginning of Basic Life Support (BLS) are essential for a better patient outcome<sup>4,10,11</sup>.

In Brazil, it is estimated that the number of deaths, out of hospital or not, caused by CRA reaches 280 thousand per year. To try to solve this public health problem and organize a regionalized and hierarchical network of emergency care services, the *Serviço de Atendimento Móvel de Urgência - SAMU* (Mobile Emergency Care Service) was implemented in 2003<sup>12</sup>. CRA's in-hospital and pre-hospital performance is related to the level of training of health professionals, who, when not trained properly, are unable to work as a life support base<sup>10</sup>. The training with theoretical-practical support must meet the requirements of the AHA, with the last update in 2015<sup>13</sup>.

In this context, prevention strategies and early recognition of CRA can reduce the risk of inadequate care, reducing mortality and limiting the occurrence of neurological damage and functional disability, in addition to adding fundamental information to prognosis and rehabilitation. Thus, the aim of the present study is to analyze the outcomes of cardiac arrest in patients in pre-hospital care..

## METHODS

Cross-sectional research with descriptive design, using a quantitative approach of an analytical type, with correlation between variables, using forms with records of attendance of patients of both sexes and age above 18 years, with initial diagnosis of CRA, completed by the care teams of the Units of Advanced Support (UAS) of the SAMU of São José do Rio Preto (SJRP), from January 2018 to June 2019.

The inclusion criteria were all records of victims over 18 years old, regardless of sex, with an initial diagnosis of CRA, attended by SAMU's USA teams. The exclusion criterion was lack of complete data the form.

The data were collected with a tool created from the data present in the care records of patients diagnosed with CRA, completed by the SAMU care teams. The profile variables analyzed were age, sex, place where CRA happened and comorbidities of the patient. The care variables analyzed were the patient's initial rhythm at the arrival in the UAS, CRA in progress, time CPR was performed by the UAS, defibrillation, medications administered, initial regulation assessment, service outcome (death confirmation, death during care and CRA reversal) and service response time.

After collecting data, patient profile variables, interventions provided and time of response were crossed with the care outcomes (death confirmation, death during the care and CRA reversal) to find out if these variables influenced the out-of-hospital CRA outcomes.

The collected and tabulated data were statistically analyzed in a descriptive and inferential way. Descriptively, the profile of the studied sample was drawn, contemplating the analyzed variables and their consequences. In this first part, the data were replicated in an absolute and relative way. To describe the results, relative and absolute frequencies, mean, standard deviation and median were calculated.

In the inferential scope, a statistical proposal was drawn, the analysis of dependence and prediction between the variables proposed in the scope of the work. The normality test performed was that of Kolmogorov Smirnov. To analyze the parametric variables, the Pearson correlation test and Poisson regression were used, within the expected standards. To know the outcomes of non-parametric variables, the Mann-Whitney U test and Spearman correlation were applied. The result was considered significant when  $p < 0.05$ . All analyzes were obtained using the SPSS Statistics® software (version 23), linked to the features of the Microsoft Excel® tool (version 2016).

The study was approved by the Research Ethics Committee of the Faculdade de Medicina de São José do Rio Preto (FAMERP), in accordance with Resolution No. 466/12, Opinion No. 3,198,041. It was requested to waive the informed consent form (ICF), as the research used secondary data with information available in the patient records, institutional information systems and/or other sources of data and clinical information available in the researched institutions. The data were analyzed anonymously and the results presented in an aggregate form, not allowing the identification of research participants and/or legal representatives.

## RESULTS

377 service records were considered eligible, but, due to incomplete data, 291 records were selected.

With regard to the outcomes of care, of the cases of CRA, 63.92% were of death verification, 30.24% of deaths during the care and 5.84% of reversed CRA patients who were referred to the hospital (Table 1).

**Table 1.** Outcomes of out-of-hospital CRA care. São José do Rio Preto, SP, Brazil, 2019.

Outcome of care	N	%
Verification of death	186	63.92
Death during care	88	30.24
Referral/Reversion	17	5.84
<b>TOTAL</b>	<b>291</b>	<b>100.00</b>

The sample was mostly composed of men (52.58%). Regarding age, the most prevalent age group was 71 to 90 years old (55.67%). The most frequent locations of CRA were residences (75.60%). Regarding comorbidities, the most prevalent among the population studied were

cardiovascular diseases (25.09%) and systemic arterial hypertension (SAH - 23.37%) (Table 2).

In the correlation of the profile variables of the victims, the interventions performed by the UAS and the response time with the outcome of care, the profile variables of the victims showed statistical evidence ( $p < 0.05$ ) when related to the outcome of care, were related the age and place of occurrence of the CRA.

The majority of death outcomes were in the 71 to 90-year-old age group, and in 55.91% and 50% of cases, verification of death and death during care, respectively. This age group was also the most prevalent, as well as the one with the highest rates in the outcome of CRA reversal, representing 82.35% of CRA victims (Table 2).

The most frequent death outcomes were residences, of which 76.14 and 75.81% were during care and verification of death, respectively. Likewise, residences were also identified as the place of greatest reversal of CRA care, with 70.59% of cases of people assisted and CRA reversed. Long-stay institutions represented only 17.65% of the reversed CRA and were referred to a hospital (Table 2).

**Table 2.** Main complications of occurrence versus outcome of care according to age, sex, location. São José do Rio Preto, SP, Brazil, 2019.

	Verification of death		CRA reversal		Death during care		Total	
	N	%	N	%	N	%	N	%
<b>Age - p = (0.001)</b>								
Up to 30 years	2	1.08	0	0.00	0	0.00	2	0.69
31 to 50 years	14	7.53	0	0.00	12	13.64	26	8.93
51 to 70 years	46	24.73	3	17.65	29	32.95	78	26.80
71 to 90 year	104	55.91	14	82.35	44	50.00	162	55.67
Over 90 years	20	10.75	0	0.00	3	3.41	23	7.90
<b>Place of occurrence p = (0.010)</b>								
Long Term Institution	24	12.90	3	17.65	4	4.55	31	10.65
Residence	141	75.81	12	70.59	67	76.14	220	75.60
Public area	21	11.29	2	11.76	17	19.32	40	13.75
TOTAL	186	100.00	17	100.00	88	100.00	291	100.00
<b>HAS - p = (0.049)</b>								
No	149	80.11	13	76.47	61	69.32	223	76.63
Yes	37	19.89	4	23.53	27	30.68	68	23.37
<b>Cardiovascular diseases p = (0.000)</b>								
No	153	82.26	10	58.82	55	62.50	218	74.91
Yes	33	17.74	7	41.18	33	37.50	73	25.09
<b>Surgeries. previous hospitalizations. bedridden p = (0.000)</b>								
No	131	70.43	14	82.35	80	90.91	225	77.32
Yes	55	29.57	3	17.65	8	9.09	66	22.68
<b>Total</b>	<b>186</b>	<b>100.00</b>	<b>17</b>	<b>100.00</b>	<b>88</b>	<b>100.00</b>	<b>291</b>	<b>100.00</b>

In the variable initial rhythm of the CRA, the highest death rates were in relation to the initial rhythm asystole, with the outcome being the death finding in 99.46% of the cases and the death outcome during care in 70.45% of the cases. However, when the outcome of reversed CRA is observed, the initial asystole rhythm was the predominant one, representing 64.71% of the analyzed medical records.

In the variable CRA in progress, CPR was performed in 64.71% of the patients whose CPR was reversed, but in relation to the outcome of death during care, CPR was performed in 53.41% of the time. before the arrival of advanced support (Table 3).

In the outcome of CRA reversal, in 88.24% of the cases, medication was administered, as it also occurred in the outcome of death during care, representing 85.23% of the cases. In the

initial information provided by the medical regulator, it was proven that, in 17.65% of cases of CRA reversal, the UAS was going to the site, while USB was already there offering assistance. However, in 20.45% of outcomes were death during care, which also occurred in this situation. In only 1.03% of the cases, guidance was given to personnel who requested care in accordance with Basic Life Support (BLS) (Table 3).

**Table 3.** Outcome of care versus interventions performed. São José do Rio Preto, SP, Brazil, 2019.

	Verification of death		CRA reversal		Death during care		Total	
<b>Did patient use medication?</b> <b>p = (0.000)</b>	N	%	N	%	N	%	N	%
No	176	94.62	2	11.76	13	14.77	191	65.64
Yes	10	5.38	15	88.24	75	85.23	100	34.36
<b>Time CRA/min</b> <b>p = (0.000)</b>	N	%	N	%	N	%	N	%
Not executed	176	94.62	1	5.88	7	7.95	184	63.23
Up to 20 CRA/Min	7	3.76	10	58.82	34	38.64	51	17.53
21 to 40 CRA/Min	2	1.08	5	29.41	30	34.09	37	12.71
41 to 60 CRA/Min	1	0.54	1	5.88	12	13.64	14	4.81
> 60 CRA/Min	0	0.00	0	0.00	5	5.68	5	1.72
<b>CRA in progress</b> <b>p = (0.000)</b>	N	%	N	%	N	%	N	%
No	170	91.40	6	35.29	41	46.59	217	74.57
Yes	16	8.60	11	64.71	47	53.41	74	25.43
<b>Use of defibrillation</b> <b>p = (0.000)</b>	N	%	N	%	N	%	N	%
No	185	99.46	11	64.71	68	77.27	264	90.72
Yes	1	0.54	6	35.29	20	22.73	27	9.28
<b>Total</b>	<b>186</b>	<b>100.00</b>	<b>17</b>	<b>100.00</b>	<b>88</b>	<b>100.00</b>	<b>291</b>	<b>100.00</b>

In the response time variable, there was no statistical evidence ( $p < 0.05$ ), as there was not in the ambulance release time variable. As the outcome of the finding of death was not configured as emergency care, it was removed from the analysis (Table 4)

**Table 4.** Response time x outcome of care. São José do Rio Preto, SP, Brazil, 2019

Information	Referral/Reversion		Death during care		Total	
	N	%	N	%	N	%
Up to 12 minutes	13	76.47	49	55.68	62	59.05
> 12 minutes	4	23.53	39	44.32	43	40.95
<b>TOTAL</b>	<b>17</b>	<b>100.00</b>	<b>88</b>	<b>100.00</b>	<b>105</b>	<b>100.00</b>

A time of arrival at the site greater than 12 minutes represented 44.32% of the outcome death during care, as well as 23.53% of the outcome of CRA reversal. Regarding ambulance release time, the time was divided into up to one minute or more than one minute. The release from the UAS for care with a time greater than one minute represented 72.73% of deaths during care and 88.24% of CRA reversal (Table 5).

**Table 5.** Discharge time versus outcome of care. São José do Rio Preto, SP, Brazil, 2019.

Information	Referral/Reversion		Death during care		Total	
	N	%	N	%	N	%
Up to 1 minute	2	11.76	24	27.27	26	24.76
> 1 minute	15	88.24	64	72.73	79	75.24
<b>TOTAL</b>	<b>17</b>	<b>100.00</b>	<b>88</b>	<b>100.00</b>	<b>105</b>	<b>100.00</b>

## DISCUSSÃO

It was found that, of the 291 care records studied, 53.58% of the patients were male, which was also identified in a study carried out at the SAMU in Londrina, in the state of Paraná, in which 61.3% of victims were from male<sup>14</sup>. The SAMU of Belo Horizonte registered 68.8% of male patients<sup>15</sup>. Studies<sup>14-16</sup> show an incidence of CRA in men three times higher than in women.

The SAMU of Belo Horizonte, in the state of Minas Gerais, reported that death among men was 1.5 times higher than women, and other studies carried out in Araras, in São Paulo, and Porto Alegre, in Rio Grande do Sul, found that the occurrence of CRA is twice as high in men<sup>15,17-19</sup>. At the same time, higher rates of CRA reversal were found in men, in 58.82% of cases, the same was found in an epidemiological survey conducted in 2005 at the SAMU of Belo Horizonte<sup>15</sup>.

The predominant age group was between 71 and 90 years old. A study carried out in Araras, São Paulo, with 322 victims of CRA, the average age was  $63.36 \pm 19.04$  years among men, and  $63.31 \pm 18.97$  years among women<sup>18</sup>. Another study carried out in Botucatu, São Paulo, reported that 68.4% of individuals who suffered from CRA were over 60 years old<sup>19</sup>. This fact can be explained by the majority of elderly people accumulating a greater number of comorbidities. However, when observing the percentage of survival in the current research, 82.35% of the cases of CRA reversal occurred in the age group between 71 to 90 years old. In a descriptive and epidemiological study that analyzed victims with immediate survival after CPR maneuvers, 41.1% of the cases occurred between 45 and 74 years of age<sup>15</sup>.

The place with the highest occurrence of deaths was residences (75.60%), followed by public areas (13.75%) and a long-term institution (10.65%). This corroborates another study that points out the residence with lower survival in relation to CRA. This can be justified by the difficulty of early recognition of CRA and the rapid activation of emergency services<sup>20</sup>. On the other hand, in the present study, when the group of CRA reversal is observed, it is possible to notice that 70.59% of the reversals occurred in residences.

The number of death certificates in long-term care facilities (12.90%), brings the fact that professionals should be able to recognize CRA early and start the chain of survival.

In most medical records, the comorbidities were not recorded, which does not mean that the victims would not have a comorbidity history, since the one who reported the case to the regulation might not have been aware of this history. In the forms that presented comorbidity, the most prevalent were: cardiovascular diseases (25.09%), systemic arterial hypertension (23.37%), neurological diseases (18.56%) and lung diseases (15.81%). Research carried out in Araras, São Paulo, reported that the most prevalent diseases in patients who suffered from CRA were: heart disease, followed by systemic arterial hypertension and diabetes mellitus<sup>10</sup>.

Age over 50 years, systemic arterial hypertension, diabetes, obesity, sedentarism, smoking, dyslipidemia and stress are factors linked to cardiovascular diseases that can lead to CRA<sup>18,21</sup>. In another study, approximately 30% of CRA deaths were caused by cardiovascular diseases<sup>21</sup>.

Regarding the use of medications, in 24% of the cases there was CRA reversal, but in 65.64% of the occurrences, no drugs were administered. In another study, 92% of victims who received medication were referred to the hospital, and 22.32% died<sup>22</sup>.

In the outcomes of care in cases of CRA, 63.92% were of death, 30.24% of deaths during care and, in 5.84% were CRA reversal, ending with the patients being referred to the hospital. These data corroborate another study, in which 93% of the outcomes of CRA was death, and only 7% of patients arrived at the specialized unit alive<sup>22</sup>.

Thus, the percentages of CRA survival are low. According to the *Instituto Brasileiro de Geografia e Estatística* - IBGE (Brazilian Institute of Geography and Statistics), which released an estimate of the population living in Brazilian municipalities in August 2019, the municipality of São José do Rio Preto has approximately 460,671 inhabitants. According to Ordinance No.

1,864, of September 29, 2003, one UAS is required for every 400,000 to 450,000 inhabitants. Currently, in the SAMU of São José do Rio Preto, there are three UAS units circulating, which is in accordance with the legislation<sup>23,24</sup>. However, the current research has shown that, although the service has quantities of advanced support ambulances suitable for care, the number of deaths is high (94.16%). The number of death certificates represented 63.92% of the victims.

The high death rates may be related to the initial rhythm of asystole, which accounted for 99.46% of deaths and 70.45% of deaths during care. A study carried out in the south of Brazil reported the rate of asystole as the worst evolution in the treatment of CRA. However, the current research found that, in relation to the reversed outcome of CRA, the most prevalent initial rhythm was also asystole, representing 64.71%, followed by pulseless electrical activity (PEA) (17.65%) and VF (17.65%). With regard to the rhythm, the verification of the initial rhythm is of great importance for the assessment of the victim's survival<sup>22</sup>.

The initial pace analyzes the efficiency of the service. Studies show that the shorter the time the ambulance arrives at the scene of the accident, the greater the chance of finding an initial shockable rhythm, which is the longest survival rate among the victims treated<sup>14,15,25,26</sup>. In only 9.28% of cases, defibrillation was used, a fact that can be justified by the majority of the death outcomes presenting an initial asystole rhythm (99.46% of the death findings and 70.45% of the deaths during care). Shock should be administered to treat VF and pulseless ventricular tachycardia (VT)<sup>20</sup>, which, in the current study, represented only 2.06% of cases.

The response time was also significant when related to the high death outcomes, since the response time greater than 12 minutes represented 55.68% of the deaths during the service. Research has shown that every minute without CRA, the chances of survival decrease from 7% to 10%<sup>27,28</sup>.

The time of arrival of more than 12 minutes represented 44.32% of the deaths during care and 23.53% of the CRA reversal, as well as the time of up to one minute to release the ambulance represented 27.27% of the deaths during the care and 11.76% of CRA reversal. The response time of up to 12 minutes represented 55.68% of deaths during care and 76.47% of CRA reversal. The ideal arrival time should be a maximum of five minutes so that neurological damage and sequelae do not occur<sup>29</sup>.

The ambulance release time of more than one minute represented 72.73% of deaths during care and 88.24% of CRA reversal. This shows that the response time is a determining factor for the outcome of CRA reversal, therefore it is important to follow the chain of survival with agility and speed<sup>30</sup>. Regarding the ambulance release time, there are no studies that describe this variable, only the response time until arrival at the location. Regulatory physicians have difficulties in diagnosing CRA, because, the information transmitted in the calls is often insufficient, thus impacting the choice of correct vehicle and, consequently, the response time.

The performance of CPR was a relevant factor in the crossing of variables in relation to the outcomes of care. In 25.43% of cases, the maneuvers were initiated before the arrival of the UAS and, in 35.05%, afterwards. Also, in 64.95% of the cases, no CPR maneuvers were performed. Of this percentage, 74.57% represented the outcome of death verification, which was reported in another study, in which, in 77, 3% of the occurrences, CPR maneuvers were not indicated, because the victims were already with clear signs of death, such as *rigor mortis* and injuries incompatible with life<sup>15</sup>. However, in 64.71% of CRA reversal cases, CPR was being performed before the arrival of the UAS, in which the American Heart Association points out that, for CPR to be successful, it is necessary to systematically follow the chain of survival, with greater emphasis on the early recognition of CPR and the activation of Advanced Life Support (ALS) and the immediate performance of CPR<sup>13</sup>.

In the duration of CPR, the most prevalent time was up to 20 minutes (17.53%), which represented 58.82% of the CRA reversal outcomes. However, in another study that determined the relationship between CPR time and survival, it was observed that it declines when the

duration of CPR exceeds 10 minutes, and this decline accelerates when chest compression time exceeds 30 minutes<sup>31</sup>.

In the outcomes, there was death in 94.16% of the cases and CRA reversed in 5.84% of the cases. On the other hand, the guidance given by the doctor in the regulation took place in only 1.03% of the visits. This fact, reported in several studies, shows that there is a need for training teams that work in mobile emergency services in relation to the BLS and ALS, reinforcing these professionals about the importance of the services provided and the correct completion of service records.

It is necessary to integrate these services to the community, aiming to train the population on the best way to act in the occurrence of CRA, instructing on the survival chain and with the early start of the CRA and, in this way, reducing the duration of CRA and the beginning of appropriate interventions<sup>31</sup>.

## CONCLUSION

This research made it possible to identify and analyze the care outcomes of out-of-hospital CRA, as well as to identify factors that influenced these outcomes. It was shown that most of the outcomes of out-of-hospital CRA care were death, and the factors that most influenced death were advanced age and place of occurrence. Residences were the most prevalent locations, possibly hampering CRA, which is witnessed by people in the community who are not qualified on the survival chain and therefore does not perform early CPR.

Among the important factors of the research, there are: cardiovascular diseases in the occurrence of death due to CRA; response time greater than one minute from UAS release; prevalence of early asystole rhythms, which represent the rhythm of the worst chances of survival of CRA. On the other hand, training the community in general in relation to the early recognition of CRA and the performance of CPR proved to be important.

The limitations of the study were the incomplete filling out of the forms and the non-marking of the distance from the SAMU unit to the places of occurrence. Not having data directly impacts the quality of the information captured, inherent in secondary data studies. In turn, this study, recognizing such facts, indicates intervention possibilities in municipal public policy.

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### CONTRIBUTIONS

**Carla Fernanda Batista Paula** contributed to the conception, collection and analysis of data and writing. **Maria Fernanda Barossi Sant'Anna** participated in the data collection and analysis. **Flávia Daniele Lucio, Daniele Alcalá Pompeo** and **Rita de Cássia Helú Mendonça Ribeiro** participated in the writing and review. Alexandre Lins Werneck collaborated in the design, writing and reviewing.

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