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Clinical, sociodemographic profile and predictors of death in intensive care unit

Perfil clínico, sociodemográfico e preditores de óbito em unidade de terapia intensiva

Perfil clínico, sociodemográfico y predictores de muerte en la unidad de cuidados intensivos

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Resumo: Objetivo: identificar o perfil sociodemográfico e clínico dos pacientes de unidade de terapia intensiva do interior do Brasil e caracterizar os óbitos e os seus fatores preditores. **Método:** estudo transversal realizado a partir da análise documental de prontuários de amostra aleatória de pacientes em cuidados intensivos. Foram coletados dados entre 2016 e 2018 utilizando instrumento padronizado. Análise descritiva realizada comparando óbitos e sobreviventes. Utilizou-se regressão multivariável para identificação dos preditores do óbito. **Resultados:** considerando os 259 pacientes analisados, ocorreram 231 mortes (89,2%). Entre os óbitos, predominaram o sexo feminino (55,4%), raça branca (75,3%) e baixa escolaridade (66,7%). As variáveis idade avançada, insuficiência cardíaca e infecção pelo vírus da imunodeficiência humana adquirida foram consideradas preditores do óbito. **Conclusão:** evidenciou-se a caracterização dos pacientes atendidos na terapia intensiva, assim como a identificação de sujeitos com maior risco de morte, fornecendo subsídios para a elaboração de estratégias efetivas de prevenção do óbito.
Descritores: Perfil de Saúde; Mortalidade; Fatores de Risco; Unidades de Terapia Intensiva; Cuidados Críticos

Resumen: Objetivo: identificar el perfil sociodemográfico y clínico de los pacientes de una unidad de cuidados intensivos del interior de Brasil y caracterizar las muertes y sus factores predictores. **Método:** estudio transversal realizado a partir de un análisis documental de las historias clínicas de una muestra aleatoria de pacientes en cuidados intensivos. Los datos se recogieron entre 2016 y 2018 utilizando un instrumento estandarizado. Se realizó

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un análisis descriptivo comparando las muertes y los supervivientes. Se utilizó una regresión multivariable para identificar los predictores de muerte. **Resultados:** considerando los 259 pacientes analizados, se produjeron 231 muertes (89,2%). Entre las muertes, predominaron el sexo femenino (55,4%), la raza blanca (75,3%) y la baja escolaridad (66,7%). Las variaciones de la edad avanzada, la insuficiencia cardíaca y la infección por virus de la inmunodeficiencia humana adquirida se consideraron predictores de la muerte. **Conclusión:** se evidenció la caracterización de los pacientes atendidos en la terapia intensiva, así como la identificación de los sujetos con mayor riesgo de muerte, suministrando subsidios para la elaboración de estrategias efectivas de prevención de la muerte.
Descriptores: Perfil de Salud; Mortalidad; Factores de Riesgo; Unidades de Cuidados Intensivos; Cuidados Críticos

Introduction

The Intensive Care Unit (ICU) is considered an overly complex hospital environment, intended for patients in severe situations. Despite advances in technology and care, patient mortality rates are still high.[1-7] A study carried out in this hospital space in Japan, showed a mortality rate of 23%.[1] In the United Kingdom, mortality affects 25.7% of patients,[2] while in Brazil research shows a mortality rate ranging from 20.4 to 50%. Disease severity and advanced age are indicated as the main predictors of death.[3-7]

Patient mortality is also associated with clinical and social characteristics, adverse events, and iatrogenic events. The analysis of quality-of-care indicators, commonly used in the ICU, such as length of stay and infection rates, may also help in understanding the factors associated with the mortality of patients in each unit.[1-8] The shortage of intensivists also impairs the outcomes and clinical outcome for critically ill patients. In many settings this problem is overcome with investments in tele-education services, aiming to train and advise professionals working in an ICU allocated to a setting with fewer resources.[9-10]

The fragilities of the healthcare system influence the mortality rates of patients, especially in inland regions, where there is less economic development, scarcity of healthcare resources, population dispersion and great geographic distances.[11] These situations condition the deficit of beds and structural conditions to ensure progressive care to critically ill patients.[12]

It is noteworthy that there is a multiplicity of clinical and surgical situations that define the generalist characteristic of most ICUs. This is because the particularities of the health care network and the health status of the population in rural areas are determinants for the care profile of these units.[11] In this context, the delimitation of the clinical and epidemiological characteristics of patients can explain the mortality profile, especially the rates and risk factors for deaths. This perspective may help in identifying the main care weaknesses and in promoting advisory and qualification actions in ICUs, contributing to reduce risks of complications and mortality.

In this sense, the following questions are posed What is the sociodemographic and clinical profile of intensive care unit patients in the interior of Brazil? What are the predictors of death? This study aimed to identify the sociodemographic and clinical profile of patients in an intensive care unit in the interior of Brazil and to characterize the deaths and their predictors.

Method

This is a cross-sectional study based on a documental analysis of medical records of patients admitted to an adult intensive care unit, between 2016 and 2018, of a general hospital in the interior of Brazil, located in a city with an estimated population of 127 thousand people. The hospital is a public-private institution, linked to the Unified Health System, and provides health care in basic and specialty areas, with medium and high complexity, being a reference for the locoregional population. The ICU has ten beds and is a reference in neurology and neurosurgery.

Inclusion criteria were medical records of patients seen in the adult ICU (age 18 years or older) from 2016 to 2018. The records of patients who remained less than 24 hours in the unit were excluded. This criterion was adopted due to the incompleteness of the records due to the infeasibility of time for the history of essential information that are configured as variables of the study.

The sample calculation was based on the total number of patients who were admitted to the ICU and the estimated mortality rate among subjects who accessed this service. A margin of error of 5%, study population size of 419 subjects (140 each year), and estimated mortality rate of 40% were used. A total of 195 subjects would be required for inclusion in the study. The medical records of patients who passed through the ICU during the study period were numbered, and then the selection process was established from random numbers generated electronically using the *Statistical Package for Social Sciences®* (SPSS) software, version 22.0. If the selected individual did not meet the above inclusion criteria, the subsequent number that met the criteria for participation was selected.

For information collection, an instrument was prepared from a previous analysis of the medical charts of patients admitted to the ICU, and the selection of socio-demographic and clinical variables, to compose this instrument, was based on scientific literature.[1-7] The following variables were considered: age; gender; profession; color/race; city of origin; marital status; education; religion; diagnosis at the time of admission; comorbidities; total time in complete days of ICU stay; use of mechanical ventilation and sedation. The clinical outcome of the patients was also verified, survival or death, the latter being considered the outcome variable in the study.

Prior to data collection, the relevance of the variables of the instrument was verified by consulting experts with experience in ICU care. The search for information was conducted from August to September 2019, in the Medical Archives and Statistics Service (SAME) of the study setting. Access to patient information occurred through paper and electronic medical records. These were organized by month and year in which the patients' hospital admission occurred. The researchers involved in this step were previously trained for the execution of the activity, in order to standardize it and avoid information bias in the study.

The collected data were organized in a file in Microsoft Excel spreadsheet manager version 16.0. For quantitative treatment, SPSS *software* was used, and for descriptive analyses,

frequency distributions were used, which were developed comparing individuals who died with those who survived. Comparisons between medical specialties in the ICU and their respective mortality rates were developed. The referred indicator was calculated using as numerator the deaths and denominator the number of patients seen multiplied by the factor one hundred (deaths/100 cases seen). Finally, a multivariable analysis was performed in order to identify predictors of death in the study population. Variables that were considered associated with death, according to scientific evidence,[1-8] such as age, education, length of hospitalization, presence of comorbidities (diabetes, hypertension, heart failure and human immunodeficiency virus infection - HIV), use of mechanical ventilation and use of sedation were included in the multivariable analysis, thus performing the adjustment of these factors for the identification of predictors of death, minimizing confounding bias in the study. We used the Poisson regression method with robust variance, which estimates the prevalence ratio as a measure of association. The significance level (α) was set at 0.05.

The present study was approved by the Research Ethics Committee, under opinion number 3,404,096, with CAAE: 12237519.4.0000.5323, on June 20, 2019. The research dispensed the use of the Informed Consent Form. The legal and ethical perspectives were respected, especially the confidentiality and privacy of the data collected, as recommended by resolution 466/2012 of the National Health Council.

Results

A total of 419 patients were admitted from 2016 to 2018. From random sampling, 259 medical records were selected, representing 61.8% of all those who were in the ICU. A total of 231 deaths occurred (89.2%) in the sample studied. Table 1 shows the sociodemographic characteristics of the research participants, comparing the deaths with the survivors.

Table 1 - Sociodemographic characteristics of ICU patients who died and survivors at the participating study institution from 2016 to 2018 (n=259).

Variables	Deaths (n=231)		Survivors (n=28)	
	n	%	n	%
Female gender	128	55.4	14	50.0
Age group				
Up to 51 years old	58	25.1	9	32.1
51 to 64 years old	59	25.5	7	25.0
64 to 73 years old	55	23.8	8	28.6
Over 73 years old	59	25.5	4	14.3
Education level				
Up to elementary school complete	154	66.7	22	78.6
Above complete fundamental education	57	24.7	5	17.9
Ignored	20	8.7	1	3.6
Race/color				
White	174	75.3	16	57.1
Brown/Black	9	3.9	2	7.1
Ignored	48	20.8	10	35.7
Work Situation				
Retired	83	35.9	7	25.0
Working	57	24.7	9	32.1
Unemployed/household	43	18.6	5	17.9
Ignored	48	20.7	7	25.0
Religion				
Catholic	129	55.8	17	60.7
Others	49	21.2	3	10.7
Ignored	53	22.9	8	28.6
Marital status				
Married or in a stable union	84	36.4	11	39.3
Single/divorced/widowed	131	56.7	16	57.1
Ignored	16	6.9	1	3.6
From				
Belongs to the municipality where the hospital is located	163	70.6	11	39.3
Does not belong to the municipality where the hospital is located	68	29.4	17	60.7

Female patients predominated (55.4%) among the deceased, while the same number of men and women were observed among the survivors. The age group up to 51 years (32.1%) prevailed among survivors and the categories 51 to 64 years and over 73 years among the individuals who died (25.5% for both), although the distribution was well balanced among the four age groups.

It was evidenced the low education level of the patients, with the majority being restricted to complete elementary school, considering the deaths (66.7%) and the survivors (78.6%). We also observed a higher frequency of white people (75.3% and 57.1%) and single, divorced, or widowed people (56.7% and 57.1%), respectively for the deceased and survivors. For the work status variable, it was found that among the deceased the highest frequency was of retirees (35.9%), while for the individuals who recovered were current workers (32.1%).

Regarding the variable origin of the patient, it is observed that 70.6% of the deaths were of individuals belonging to the municipality where the hospital is located, while 60.7% of the survivors did not belong to the municipality. Regarding clinical characteristics, the predominance of the neurology specialty among deaths (31.2%) and survivors (42.9%) stands out (Table 2).

The presence of comorbidities was verified, especially systemic arterial hypertension (40.3% and 39.3%), diabetes mellitus (24.2% and 32.1%), stroke (15.2% and 14.3%) and chronic obstructive pulmonary disease (COPD) (15.2% and 10.7%), respectively for patients who died and those who recovered. Most patients were submitted to mechanical ventilation among deaths (77.9%) and survivors (89.3%). The length of stay showed predominance of the category up to two days (32.9%) among deaths, while survivors showed more than nine days (35.7%).

Table 2 - Clinical characteristics of ICU patients who died and survivors in the institution participating in the study, RS, Brazil, from 2016 to 2018 (n=259).

Variables	Deaths (n=231)		Survivors (n=28)	
	n	%	n	%
Specialty				
Neurology	72	31.2	12	42.9
Pneumology	66	28.6	5	17.9
Cardiology	28	12.1	5	17.9

Nephrology	18	7.8	1	3.6
Gastroenterology	15	6.5	1	3.6
Oncology	7	3.0	1	3.6
Obstetrics	2	0.9	3	10.7
Others	23	9.9	-	-
Patients with health problems				
Systemic Arterial Hypertension	93	40.3	11	39.3
Diabetes Mellitus	56	24.2	9	32.1
Congestive Heart Failure	22	9.5	-	-
Chronic Renal Insufficiency	17	7.4	2	7.1
Cerebrovascular Accident	35	15.2	4	14.3
COPD	35	15.2	3	10.7
Pulmonary Emphysema	3	1.3	-	-
Tuberculosis	6	2.6	-	-
Pneumonia	10	4.3	1	3.6
Cancer	14	6.1	1	3.6
HIV	13	5.6	-	-
Syphilis	1	0.4	-	-
Hepatitis	1	0.4	1	3.6
Hospitalization time				
Up to 2 days	76	32.9	7	25.0
2 to 4 days	50	21.6	7	25.0
4 to 9 days	55	23,8	4	14.3
More than 9 days	50	21.6	10	35.7
Mechanical Ventilation	180	77.9	25	89.3
Sedation	115	49.8	17	60.7

COPD: Chronic Obstructive Pulmonary Disease; HIV: human immunodeficiency virus.

In table 3 are presented the mortality indicators, considering the cause of hospitalization by specialty. It is observed that the highest mortality rates (deaths per 100 cases attended) are in the specialties of nephrology (94.74), gastroenterology (93.75) and pulmonology (92.96). This rate in neurology is also high (85.71) and the lowest was in obstetrics (40.0).

Table 3 - Mortality indicators by medical specialty among ICU admissions in the institution participating in the study, RS, Brazil, from 2016 to 2018 (n=236).

Specialty	Number of persons served	Percentage	Mortality rate*
Nephrology	19	8,05	94.74
Gastroenterology	16	6.77	93.75
Pneumology	71	30.08	92.96

Oncology	8	3.38	87.50
Neurology	84	35.59	85.71
Cardiology	33	13.98	84.85
Obstetrics	5	2.11	40.00

*Deaths per 100 cases attended.

According to Table 4, a multivariate analysis was performed in order to identify predictors of ICU death. First, in the univariate model, the presence of heart failure ($p < 0.001$; RP = 0.134) and HIV ($p < 0.001$; RP = 1.128) were statistically significant, showing risk for death. The condition of living in the city where the hospital is located ($p = 0.006$) also showed statistical significance, presenting itself as a risk factor for death (PR = 1.171).

Table 4 - Multivariate analysis to identify the predictors for death among patients seen in the ICU of the institution participating in the study, RS, Brazil, from 2016 to 2018 (n=259).

Factors	**Univariate**					**Multivariate –** N = 238 LR = -234.879				
	n	**%**	**PR**	**IC (95%)**		**n**	**%**	**RP**	**IC (95%)**	
Age ≥73 years	63	24.3	1.082	0.965	1.213	61	25.6	1.158	1.001	1.340
Age 64 to 73 years	63	24.3	1.008	0.883	1.152	58	24.4	1.086	0.921	1.281
Age 51 to 64 years	66	25.5	1.033	0.911	1.171	61	25.6	1.089	0.935	1.267
Age ≤51 years	67	25.9	1.0	-	-	58	24.4	1.0	-	-
Resident of the institution's headquarter city Hospital	174	67.2	1.171	1.046	1.311	159	66.8	1.173	1.043	1.319
Resident of other municipalities	85	32.8	1.0	-	-	79	33.2	1.0	-	-
Education - complete elementary school	176	73.9	1.051	0.958	1.152	176	73.9	1.041	0.937	1.155
Education High School or better	62	26.1	1.0	-	-	62	26.1	1.0	-	-
Presence of DM	65	25.1	0.955	0.857	1.064	62	26.1	0.940	0.846	1.045
Absence of DM	194	74.9	1.0	-	-	176	73.9	1,0	-	-
Presence of CHF	22	8.5	1.134	1.082	1.188	21	8.8	1.174	1.068	1.292
Absence of CHF	237	91.5	1.0	-	-	217	91.2	1.0	-	-
Presence of HIV	13	5.0	1.128	1.079	1.180	10	4.2	1.217	1.069	1.384
Absence of HIV	246	95.0	1.0	-	-	228	95.8	1.0	-	-

Presence of SAH	104	40.2	1.004	0.921	1.095	-	-	-	-	-
Absence of SAH	155	59.8	1.0	-	-	-	-	-	-	-
9 days or more of hospitalization	60	23.2	0.910	0.799	1.037	59	24.8	0.931	0.820	1,056
From 4 to 9 days of hospitalization	59	22.8	1.018	0.926	1.119	50	21.0	1.062	0.963	1.171
2 to 4 days hospitalization	57	22.0	0.958	0.852	1.077	53	22.3	0.987	0.869	1.119
Up to 1 day of hospitalization	83	32.0	1.0	-	-	76	31.9	1.0	-	-
Specialty Others	71	27.4	1.068	0.955	1.195	66	27.7	1.012	0.909	1.127
Respiratory Specialty	71	27.4	1.085	0.973	1.209	64	26.9	1.029	0.924	1.146
Cardiology Specialty	33	12.7	0.990	0.836	1.172	31	13.0	0.922	0.722	1.102
Neurological Specialty	84	32.4	1.0	-	-	77	32.4	1.0	-	-
MV Use	205	79.2	0.930	0.856	1.010	-	-	-	-	-
Did not use MV	54	20.8	1.0	-	-	-	-	-	-	-
Sedation Use	132	51.0	0.954	0.876	1.038	-	-	-	-	-
Did not use sedation	127	49.0	1.0	-	-	-	-	-	-	-

LR: Likelihood Ratio; PR: Prevalence Ratio; CI: Confidence Interval; DM: Diabetes Mellitus; SAH: Systemic Arterial Hypertension; CHF: Congestive Heart Failure; MV: Mechanical Ventilation.

In the multivariable model, in which the influence of predictors for death is verified adjusting for all variables included in the model, the following were selected: age, municipality of origin, education, diabetes, heart failure, HIV infection, length of hospitalization and specialty of care. The variables that showed statistical significance were age, for the highest age group (greater than 73 years) (P value = 0.050; PR = 1.158); belonging to the municipality of origin of the hospital institution (P = 0.008; PR = 1.173); presence of heart failure (P = 0.001; PR = 1.174) and HIV infection (P = 0.003; PR = 1.217). All factors listed showed an association indicating risk for death. There was no statistical significance for the other variables included in the model.

Discussion

The findings of the social profile of patients admitted to an ICU in the interior of Brazil partially corroborate the scientific publications for this approach. It was found that there was a predominance of female patients, differently from other studies that disclosed a predominance of males.[2-5] Most patients have a low level of education, a fact that is in agreement with a survey carried out in the Northeast of Brazil that disclosed that 63.5% of patients in the ICU have only complete primary education.[13] The average age of patients is 61 years, a result similar to that in literature.[2-5] Population aging tends to increase demand for intensive care services and is directly related to increased death.7 Moreover, age was considered a predictor of death, presenting statistical significance in the multivariate analysis (category greater than or equal to 73 years).

The present study showed variability of the specialties seen, reflecting the generalist characteristic of the Brazilian countryside ICUs. The neurology specialty slightly surpassed the other specialties (cardiology, pulmonology and others). Cerebrovascular diseases are one of the main causes of morbidity and mortality. This same finding was evidenced in studies that highlight that the neurocritical patient requires support and technology to ensure high complexity care.[3,5-6] In another publication, the prevalence of stroke and non-traumatic neurological injuries was noted as situations that predominate in this hospital setting.7 Although the neurology specialty was prevalent, it was observed that the highest mortality rate occurred in the nephrology specialty (94.7 deaths per 100 cases), followed by gastroenterology and pulmonology specialties. The lethality involving patients with renal impairment may be associated with the hemodynamic instability that prevails in this phenotype and the complications associated with renal replacement therapy.

Systemic arterial hypertension is considered a relevant risk factor for the development of severe neurological events,[3] which is in line with the findings of this research, since this disease was the most frequent among the comorbidities, although it did not prove to be statistically

significant in the multivariate analysis. Another relevant comorbidity was diabetes mellitus, the second most frequent clinical event. In literature it is highlighted as one of the most prevalent chronic conditions in critically ill patients.[3] The presence of congestive heart failure or HIV infection were evidenced as risk factors for death in ICU patients. In other studies, heart failure was found to be the cause of death in critically ill patients.[3,7] Comorbidities are important predictors of death in the short term and their existence minimizes the possibility of obtaining an improved prognosis.[1] In this sense, the importance of clinical evaluation and identification of comorbidities at the time of admission of the patient to the ICU is emphasized in order to consider them in the therapeutic plan and avoid the onset of associated complications.

The use of mechanical ventilation and sedation are assistive measures necessary for the management of most critical life situations. Specifically, invasive mechanical ventilation aims to maintain oxygenation and ventilation in patients with acute or acute chronic respiratory failure. Sedation is also related to the use of invasive mechanical ventilation, since it is the initial requirement to establish advanced ventilatory support.[14] Research highlights that the use of sedation may trigger delirium and prolong the time of mechanical ventilation use, increasing the risk of mortality by 10% per day.[2,14] A different situation from the present study, in which the use of mechanical ventilation and/or sedation were not evidenced as predictors of death.

The data on length of stay showed a longer period among survivors compared to deaths, like the findings of other studies.[4,7] On the other hand, length of stay in the ICU showed no statistically significant association with mortality in this study.

This fact may be associated with the severe condition and irreversible organic dysfunctions presented by the patient at the time of admission, which is usually delayed by waiting for a bed/available space in intensive care, contributing to death in the first days of ICU. In a study that compared death rates between public and private institutions, this relationship was statistically significant.[4] In public units' total length of stay is on average 10.59 days and

mortality reaches 25.52%. In private ICUs, the average length of stay is seven days, and mortality reaches only 14.52% of patients.

The study showed that almost 90% of patients in the ICU died, showing a mortality rate almost twice as high, when compared to other publications.[1-6] This result may also represent the reality of other inland hospital institutions in Brazil, obscured by the scarcity of research in ICUs facing the same fragilities of the health system.[13] Furthermore, most scientific articles analyzing the ICU patient's health profile are developed in high complexity reference institutions and centers of excellence in critical care.[1-3,5-7,14-15] In these institutions a lower death rate is expected, because the structure of the care network, including hospitals and ICUs, minimally ensures the necessary support for the progressive care of the critically ill patient.[12]

Research has shown that the risk of death in small and medium-sized hospitals is almost twice the risk of death in large hospitals.[16] Moreover, hospital mortality rates are higher in settings where resources are limited.[10] This became evident during the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-COv-2) pandemic, in which health systems face severe restrictions on the capacity and accessibility of diagnostic and intensive care services, leading to poorer clinical outcomes and higher mortality.[17]

In Brazil, this situation is more complex in the interior regions, where there is the greatest deficit of ICU beds.[12,18-19] A survey conducted by the Brazilian Intensive Care Medicine Association in 2016 showed that the proportion of ICU beds for every 10,000 inhabitants in the country was 4.26% for the capital cities and only 1.33% for the interior.[12] The discrepancy is even greater in the Northeast and North regions of Brazil (4.02% and 0.60%, respectively). In Rio Grande do Sul, it is verified in the capital Porto Alegre, a rate of 6.30% of ICU beds for each 10 thousand inhabitants, while in the interior of the state the value is 1.47% for this same rate.12 According to a survey carried out in the state of Rio de Janeiro, an increase of 122% of beds is

required to ensure the stability of the system and 134% for a maximum waiting time of six hours.[20] Studies have also shown that the longer the waiting time of critically ill patients for an ICU bed, the higher the mortality in this group.[15,19]

In addition to increasing the number of beds, other management actions can contribute to reducing the rate of deaths in the ICU: strengthening of the bed regulation centers; development of protocols that prioritize the care of the most severely ill patients; expansion of back-up beds that allow the patient to be discharged from the ICU when clinically fit; qualification of pre-hospital and emergency care; and continuing education for the multi-professional team.[18-19]

It is also worth noting that, with respect to the variables associated with death, belonging to the municipality where the hospital was located was considered a risk factor for death. Information about the network of inter-municipal services in the region deserves more detailing to understand this finding. Small cities refer patients to the ICU of the study, which is a reference in high complexity in neurology in the region. The concession of beds has as main criteria the diagnosis/diagnostic hypothesis and the patient's transport/inter-municipal transference that occurs after clinical stabilization. Receiving this assistance prior to admission in the ICU, still in the city of origin, can contribute to the outcome with better results for these patients.

One of the limitations of the present research is the non-use of scales to predict the risk of death of patients. Another issue to be considered is the use of secondary data in this research, which depends on the quality and availability of information. It is also worth mentioning the difficulties regarding the completeness of the records in the medical charts, which makes the research team's work even more challenging.

Conclusion

Among the findings, considering the total of 259 patients analyzed, there were 231 deaths (89.2%). Among the deaths, female gender (55.4%), white race (75.3%) and low education (66.7%) predominated. The variables age, heart failure and HIV infection were considered predictors of death.

It is important to develop multicenter studies that include in the research countryside ICUs in Brazil to know other realities. It was also evident the need to contextualize the predictors of death in relation to the organization and resources of the health care network.

The study results allowed the identification of subjects at higher risk of death, enabling the development of effective strategies for death prevention in the intensive care environment. Furthermore, it contributes to the rationale and replanning of health actions in the ICU, as well as to the review and updating of care protocols. Furthermore, the findings highlight the relevance of the articulation with the local care network for bed regulation, contributing to the strategic and organizational planning of health services.

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