Original Article
doi: https://doi.org/10.1590/1983-1447.2023.20210334.en

Nursing workload in oncological intensive care in the COVID-19 pandemic: retrospective cohort

Carga de trabalho da enfermagem de terapia intensiva oncológica na pandemia da COVID-19: coorte retrospectiva

Carga de trabajo de enfermería en terapia intensiva oncológica en la pandemia de COVID-19: cohorte retrospectiva

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How to cite this article:
Lima VCGS, Pimentel NBL, Oliveira AM, Andrade KBS, Santos MLSC, Fuly PSC. Nursing workload in oncological intensive care in the COVID-19 pandemic: retrospective cohort. Rev Gaúcha Enferm. 2023;44:e20210334. doi: https://doi.org/10.1590/1983-1447.2023.20210334.en

ABSTRACT

Objective: To compare the nursing workload in an oncology intensive care unit according to the condition of COVID-19 infection.

Method: A retrospective cohort study. The Nursing Activities Score was used to measure the workload and document analysis for data extraction. The medical records were divided into a group of patients with COVID-19 and another group of patients without the infection.

Results: The values of the Nursing Activities Score were not different depending on the sociodemographic variables, but the average of this score was statistically different depending on whether the patient had the diagnosis of COVID-19 or not, being higher in those who had the disease.

Conclusion: It was proved that the nursing workload is high in the context of the oncology intensive care unit. However, COVID-19 increased this score even more, with the Nursing Activities Score being an important tool to size the team in this context.

Keywords: Oncology nursing. Coronavirus infections. Work hours.

RESUMO

Objetivo: Comparar a carga de trabalho da enfermagem em unidade de terapia intensiva oncológica, de acordo com a condição de infecção por COVID-19.

Método: Estudo do tipo coorte retrospectiva. Utilizaram-se do Nursing Activies Score para mensuração da carga de trabalho e da análise documental para extração dos dados. Os prontuários foram divididos em um grupo de pacientes com COVID-19 e outro grupo de pacientes sem a infecção.

Resultados: Os valores do Nursing Activies Score não foram diferentes, conforme as variáveis sociodemográficas, porém a média deste escore foi estatisticamente diferente a depender de o paciente apresentar ou não o diagnóstico de COVID-19, sendo superior naqueles que possuíam a doença.

Conclusão: Comprovou-se que a carga de trabalho da enfermagem foi alta no contexto da unidade de terapia intensiva oncológica. No entanto, a COVID-19 aumentou ainda mais este escore, sendo o Nursing Activies Score importante ferramenta para dimensionar a equipe nesse contexto.

Palavras-chave: Enfermagem oncológica. Infecções por coronavírus. Jornada de trabalho.

RESUMEN

Objetivo: Comparar la carga de trabajo de enfermería en una unidad de cuidados intensivos oncológicos según el estado de infección por COVID-19.

Método: Estudio de cohorte retrospectivo. El Nursing Activities Score se utilizó para medir la carga de trabajo y el análisis de documentos para la extracción de datos. Las historias clínicas se dividieron en pacientes con COVID-19 y pacientes sin la infección.

Resultados: Los valores del Nursing Activities Score no fueron diferentes en función de las variables sociodemográficas, pero el promedio de este puntaje fue estadísticamente diferente en función de si el paciente tenía COVID-19 o no, siendo mayor en aquellos que lo tenían.

Conclusión: Se comprobó que la carga de trabajo de enfermería es elevada en la unidad de terapia intensiva oncológica. Sin embargo, el COVID-19 aumentó aún más este puntaje, siendo el Nursing Activities Score una herramienta importante para dimensionar el equipo en este contexto.

Palabras clave: Enfermería oncológica. Infecciones por coronavirus. Horas de trabajo.

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INTRODUCTION

Cancer is a major public health problem in the world, particularly in developing countries, and it is among the four leading causes of death before the age of 70 in many countries. Cancer incidence and mortality rates have increased considerably, either because of aging, population growth, or else a due to a change in the distribution and prevalence of cancer risk factors, especially those associated with socioeconomic development[1]. In Brazil, according to the National Cancer Institute (INCA), it is estimated that 625,000 new cases of cancer will occur for each year of the 2020-2022 triennium[1].

This scenario was aggravated, at the end of 2019, with the onset of a new respiratory infection called Coronavirus Disease-2019 (COVID-19), caused by the new coronavirus, the Severe Acute Respiratory Syndrome Coronavirus 2, known as SARS-CoV-2[2]. This infection has great potential to worsen the clinical condition of patients with chronic diseases, such as cancer, as these patients are among the most vulnerable to serious diseases caused by respiratory viral infections[3].

COVID-19 emerged in China and quickly spread to several countries on all continents, radically changing the routine of the population, and motivating cities to declare a state of emergency and situation of public calamity. After the World Health Organization (WHO) declared the novel coronavirus outbreak a global pandemic in March 2020, health services and work processes were affected, inevitably impacting the routine of professionals, generating new care flows and protocols[2].

According to literature data, cancer patients undergoing active treatment have a higher risk of developing serious events related to COVID-19, requiring hospitalization in the Intensive Care Unit (ICU)[3]. Therefore, the nursing team must be prepared to implement various activities that range from monitoring vital signs and careful management of vasoactive drugs to actions taken to manage the various related complications[3–4].

In the context of critically ill patients, studies indicate the use of the Nursing Activities Score (NAS) as a strategic tool to measure the nursing workload and enable the projection of the amount of human resources needed for the safe care of this clientele[5]. The NAS is an instrument for measuring workload, introduced in the practice of intensive care nursing in the 20th century, in the United States (US), with the purpose of calculating the ideal number of health professionals necessary to provide optimal care for critical patients[4–5]. The development of the instrument was based on the Therapeutic Interventions Score System and, in 2003, was translated and validated in Brazil[5].

According to the results of a survey carried out by Osvaldo Cruz Foundation (Fiocruz), in 2021, the pandemic had a significantly impact on the lives of health professionals, generating overwork, with long working hours and strong signs of physical exhaustion[6]. However, no studies were found that measured this excessive workload or suggested adequate sizing. Gaps were identified in the care of critical cancer patients in this scenario, both regarding the measurement of the nursing workload and the calculation of the number of professionals required, with indicators that translate this reality through statistical data. Studies on the nursing workload required in the assistance to cancer patients are available in the literature[7–8]. However, in the context of the COVID-19 pandemic, data regarding this topic has not yet been demonstrated, which makes it an unexplored field.

From this perspective, studies that evaluate the application of NAS in the daily routine of the nursing team of the oncology ICU, in the midst of the COVID-19 pandemic, are essential, to provide information that can support nursing care, according to the needs of this clientele and the health institution. In order to guide improvements in the management of care for cancer patients affected by COVID-19, the present study aimed to compare nursing workload in an oncology intensive care unit, according to the condition of infection by COVID-19.

METHOD

This study was carried out in accordance with the guidelines of the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE), specifically for observational studies[9].

Study design

This is an observational, analytical, cohort, retrospective study. Documentary analysis was used for data extraction. In retrospective cohort studies, a population is followed over time in search for a possible association between exposure and outcome, and, in the retrospective study, in turn, previous information on the exposure factor is collected.

Study site

The study was carried out in the Intensive Care Unit (ICU) of a national hospital of reference in the field of oncology,

of the federal public network, located in Rio de Janeiro, RJ, Brazil. The referred unit is medium-sized and is intended for cancer patients in the specialties of gynecology and bone-connective tissue (BCT) cancer. This ICU has six beds for critical patients of the specialties treated at the hospital, and during the pandemic, two of these beds were intended for isolation due to COVID-19 and four for patients without COVID-19.

Participants

The medical records of cancer patients admitted to the ICU between March and July 2020 were eligible for analysis. The date of March 11, 2020, the beginning of the pandemic, as declared by the WHO[10], was selected or this time frame. The justification for the selection of this period is that the present study meets one of the objectives of the research project entitled: "Nursing workload in the care of critical cancer patients".

The following eligibility criteria were used for the composition of the sample: medical records of patients aged 18 years or older, admitted to the ICU during the time frame of the study, regardless of the medical oncological diagnosis, who had a record in the NAS spreadsheet made in the sector. Medical records that were not available at the time of collection and those still awaiting the result of the Reverse Transcription Polymerase Chain Reaction (RT-PCR) test for the diagnosis of COVID-19 were excluded. The RT-PCR test is considered the gold standard for the diagnosis of COVID-19 and is available at the institution where this study was carried out[11].

The consecutive non-probabilistic sample was divided into two groups: the first with medical records of cancer patients with a negative result in the RT-PCR test of COVID-19 and the second with medical records of cancer patients with a positive result in the RT-PCR test of COVID-19.

Data source and measurement

Data collection was performed retrospectively and took place by consulting the medical records of cancer patients hospitalized in the unit studied. The information was collected through an instrument containing the sociodemographic and clinical variables extracted from the medical records of the patients selected for this study. The NAS average was calculated by consulting the NAS spreadsheet, filled in by nurses during the hospitalization period. This scale is composed of 23 indicators, distributed in 14 dimensions, which stratify nursing actions in terms of management, care and education. The score result represents the percentage of time spent with each patient[12–13].

Nursing workload is calculated based on the sum of the scores assigned to the indicators of each of the dimensions. The sum of NAS points measures the percentage of nursing time dedicated to direct and indirect patient care, in a 24-hour period, and each point corresponds to 14.4 minutes[12–13]. Therefore, two NAS points are approximately equivalent to half an hour and the time spent by the nursing team in direct care of each patient, thus reaching 176.8%. Thus, if the score is 100, it is understood that the patient required 100% of the time of a nursing professional for care, in the last 24 hours[13].

At the study site, the NAS measurement is performed by a nurse on duty for all patients, once every 24 hours, during the patients' stay in the ICU. A computerized spreadsheet inserted in a folder in the institutional network is used to facilitate the daily filling by nurses and the calculation of the indicators. For the present study, the monthly mean NAS was calculated as the sum of the patient's daily NAS scores divided by the number of days spent in the ICU.

Bias

In order to minimize possible biases, the data were entered by two people independently and subsequently compared for the detection of errors.

Sample size

In this study, given that convenience sampling was used, no sample calculation was performed**.**

Variables

The independent variables related to sociodemographic and clinical characteristics were selected. Numerical variables were as follows: mean NAS, age, number of children and length of stay in the ICU; and categorical: gender, education, marital status, type of tumor, clinic, reason for hospitalization, origin and COVID-19 infection.

The mean of the NAS during the hospitalization period was considered as an outcome variable, and the diagnosis of COVID-19 was the indicator variable for the stratification of the groups.

Raw data distributions and percentages or central tendency and dispersion measures were calculated for the sociodemographic and clinical quantitative variables. The normal distribution of the NAS Score, considered the primary outcome variable, was verified using the Shapiro-Wilk test.

Statistical analysis

The data were entered into a database and the final version was taken to Stata software, version 16.0, where the analyzes were performed. Chi-square and Fisher's exact tests were selected to verify the association between sociodemographic and clinical variables and diagnosis of COVID-19 among study participants. In the weighting of the sociodemographic and clinical variables examined, the differences in NAS Score means were investigated by Student's t test or one-way analysis of variance (ANOVA), and selection was conditioned to the number of categories. The multiple linear regression model was estimated, with the NAS score as the dependent variable, and the sociodemographic and clinical variables as independent variables, considering the temporal variation between explanatory variables and outcome. The variables were selected by the backward method. The significance level adopted in the analysis was 5%. The results are presented in tables and in the graph.

Ethical aspects

The study was approved by the Research Ethics Committee in April 2018 (protocol no.2,824,910, amendment no.4,539,267 and Certificate of Presentation of Ethical Appreciation no. 93474518.6.0000.5274).

RESULTS

A total of 97 medical records of patients admitted to the ICU from March to July 2020 were identified. After application of the established inclusion criteria, 69 medical records were selected and divided into two groups: the group of cancer patients with COVID-19, with 26 patients; and the group of patients without COVID-19, with 43 patients.

The mean age of the patients was 60.5 (±16.2) years, the average length of stay was 6.3 (±6.41) days, and there was a predominance of women. The prevalence of COVID-19 in the study sample was 37.68%. The predominant comorbidities in the participants were, respectively: arterial hypertension, diabetes mellitus and obesity. Most participants had two comorbidities. The occurrence of COVID-19 was not associated with the sociodemographic and clinical characteristics investigated (Table 1).

The mean NAS Score was 92.99 (±30.58) in the general sample. The mean score was higher than this cutoff in male participants over 60 years of age, in addition to those who lived without a partner and had no or more than four children. Nevertheless, NAS scores were not statistically different according to gender, age group, education, marital status and number of children (Table 2).

The mean NAS score was statistically different (p=0.001) and higher among patients with COVID-19. The scores also differed depending on the reason for hospitalization, whether or not the patient was undergoing clinical treatment, the number of comorbidities and the outcome of the case during hospital admission.

Among the discharged patients, the median NAS score was slightly higher in those with COVID-19. However, there was potential variation. Among the patients who died, the median NAS score was substantially higher in those who had COVID-19 (Figure 1).

The multiple linear regression model indicated that a diagnosis of COVID-19 in the patient resulted in an increase of 22.406 points in the NAS Score (p<0.001), while undergoing clinical treatment and having acute respiratory failure due to COVID-19 led to an increase of 20.539 (p=0.017) and 38.180 (p=0.029) points. The other variables included in the analysis were not significant to change the NAS score (Table 4).

Table 1 – Sociodemographic and clinical characterization and association with diagnosis of COVID-19 of the patients included in the study (n=69). Rio de Janeiro, Rio de Janeiro, Brazil, 2020

Variables	Total sample		With COVID-19		Without COVID-19		p-value
	n	%	n	%	n	%	
Gender							0.444*
Female	61	88.41	22	36.07	39	63.93	
Male	8	11.59	4	50.0	4	50.0	
Age range (years)							0.331*
19 – 40	10	14.71	5	50.0	5	50.0	
41 – 59	18	26.47	4	22.22	14	77.78	
60 – 70	21	30.43	10	47.62	11	52.38	
71 – 87	20	29.41	7	35.0	13	65.0	
Education							0.597†
Illiterate	6	8.70	4	66.67	2	33.33	
Literate	2	2.90	0	0	2	100.0	
Incomplete primary education	20	28.99	14	70.0	6	30.0	
Complete primary education	13	18.84	9	69.23	4	30.77	
Incomplete secondary education	3	4.35	2	66.67	1	33.33	
Complete secondary education	18	26.09	11	61.11	7	38.89	
Incomplete higher education	3	4.35	1	33.33	2	66.67	
Complete higher education	3	4.35	2	66.67	1	33.33	
Not informed	1	1.45	0	0	1	100.0	
Marital status							0.674*
With a companion	27	39.13	11	40.74	16	59.26	
No companion	42	60.87	15	35.71	27	64.29	
Number of children							0.632*
No children	11	15.94	5	45.45	6	54.55	

Table 1 – Cont.

Variables	Total sample		With COVID-19		Without COVID-19		p-value
	n	%	n	%	n	%	
One	20	28.99	8	40.0	12	60.0	
Two or three	25	36.23	7	28.0	18	72.0	
Four or more	13	18.84	6	46.15	7	53.85	
Inpatient facility							0.179†
Gynecology	46	66.67	15	32.61	31	67.39	
BCT cancer	10	14.49	4	40.0	6	60.0	
Oncology	9	13.04	4	44.44	5	55.56	
Mastology	3	4.35	3	100	0	0	
Urology	1	1.45	0	0	1	100	
Arterial hypertension							0.683*
Yes	43	62.32	17	39.53	26	60.47	
No	26	37.68	9	34.62	17	65.38	
Obesity							0.654*
Yes	14	20.29	6	42.86	8	57.14	
No	55	79.71	20	36.36	35	63.64	
FA							0.684†
Yes	3	4.35	1	33.33	2	66.67	
No	66	95.65	25	37.88	41	62.12	
Diabetes Mellitus							0.160*
Yes	23	33.33	6	26,09	17	73.91	
No	46	66.67	20	43.48	26	56.52	
Cardiopathy							0.431†
Yes	8	11.59	2	25.0	6	75.0	
No	61	88.41	24	39.34	37	60.66	

Table 1 – Cont.

Variables	Total sample		With COVID-19		Without COVID-19		p-value
	n	%	n	%	n	%	
Hypothyroidism							0.464†
Yes	8	11.59	4	50.0	4	50.0	
No	61	88.41	22	36.07	39	63.93	
Dyslipidemia							0.514†
Yes	4	5.80	1	25.0	3	75.0	
No	65	94.20	25	38.46	40	61.54	
Number of comorbidities							0.338*
None	13	18.84	5	38.46	8	61.54	
One	15	21.74	7	46.67	8	53.33	
Two	22	31.88	5	22.73	17	77.27	
Three or more	19	27.54	9	47.37	10	52.63	
Complications							0.327†
Oncological	24	35.29	14	58.33	10	41.67	
Metabolic	11	16.18	2	18.18	9	81.82	
Pulmonary	8	11.76	3	37.50	5	62.50	
Infectious	6	8.82	1	16.67	5	83.33	
Cardiovascular	5	7.35	3	60.0	2	40.0	
Cardiopulmonary	4	5.88	2	50.0	2	50.0	
Cardiac	3	4.41	0	0	3	100	
Surgical	2	2.94	1	50.0	1	50.0	
Neurological	1	1.47	1	100	0	0	
No report	4	5.88	1	25.0	3	75.0	

Source: Elaborated by the authors.
* Chi-square test. † Fisher's exact test.

Table 2 – Distribution of NAS score by sociodemographic variables (n=69). Rio de Janeiro, Rio de Janeiro, Brazil, 2020

Variables	NAS Score				p-value
	Mean	SD	Minimum	Maximum	
Gender					0.561[|]
Female	92.22	29.95	48.7	195.1	
Male	98.85	36.75	63.5	183.0	
Age range (years)					0.701[†]
19 – 40	89.23	16.20	73.6	123.7	
41 – 59	87.01	30.82	48.7	195.1	
60 – 70	95.33	29.77	59.3	188.0	
71 – 87	97.79	37.0	63.2	183.0	
Education					0.260[†]
Illiterate	87.86	22.47	63.5	118.5	
Literate	117.7	56.85	77.5	157.9	
Incomplete primary education	84.44	23.48	48.7	172.95	
Complete primary education	84.03	17.54	59.3	115.2	
Incomplete secondary education	89.57	9.34	80.6	102.7	
Complete secondary education	110.52	45.57	50.8	195.1	
Incomplete higher education	96.78	13.54	84.4	111,25	
Complete higher education	84.86	14.74	67.9	94.6	
Not informed	90.5	-	90.5	90.5	
Marital status					0.673[*]
With a companion	91.03	20.87	59.3	174.0	
No companion	94.25	35.65	48.7	195.1	
Number of children					0.770[†]
No children	99.09	33.28	80.0	195.1	
One	95.43	33.8	48.7	183.0	
Two or three	88.26	30.98	50.8	188.0	
Four or more	93.16	23.63	73.6	157.9	

Source: Elaborated by the authors.
* Teste t de Student. † One-way ANOVA.

Table 3 – Distribution of NAS score by clinical variables (n=69). Rio de Janeiro, Rio de Janeiro, Brazil, 2020

Variables	NAS Score				P value
	Mean	SD	Minimum	Maximum	
COVID-19					0.001*
Yes	110.89	41.55	48.7	195.1	
No	82.16	12.99	50.8	113.9	
Hospitalization clinic					0.619†
Gynecology	90.99	28.24	48.7	195.1	
BCT cancer	97.15	32.96	63.5	183.0	
Oncology	91.93	31.80	59.3	172.95	
Mastology	118.26	60.43	81.20	188.0	
Urology	77.20	-	77.20	77.20	
Reason for hospitalization					0.005†
Acute respiratory failure	84.56	12.12	68.8	102.7	
Acute respiratory failure caused by COVID-19	119.09	42.84	48.7	195.1	
Immediate postoperative period	83.96	13.60	50.8	113.9	
General state decline	98.87	34.48	71.3	174.0	
Sepsis	75.27	8.24	63.1	82.1	
Others	76.81	7.52	67.8	881.1	
Clinical treatment					0.042*
Yes	108.43	40.54	76.1	195.1	
No	87.84	27.98	27.7	188	
Surgical treatment					0.153*
Yes	89.40	26.99	48.7	188.0	
No	100.76	35.16	48.70	195.1	
Chemotherapy treatment					0.976*
Yes	93.16	34.14	48.7	188.0	
No	92.92	29.28	50.8	195.1	

Table 3 – Cont.

Variables	NAS Score				P value
	Mean	SD	Minimum	Maximum	
Radiotherapy treatment					0.429*
Yes	86.90	21.93	48.7	123.7	
No	94.40	32.26	50.8	195.1	
Brachytherapy treatment					0.469*
Yes	84.28	24.21	48.7	118.5	
No	93.82	31.15	50.8	195.1	
Arterial hypertension					0.214*
Yes	96.57	35.92	50.8	195.1	
No	87.07	17.84	48.7	123.7	
Obesity					0.544*
Yes	97.45	42.59	59.3	195.1	
No	91.85	27.11	48.7	183.0	
FA					0.717*
Yes	99.3	6.23	92.1	103,1	
No	92.70	31.23	48.7	195.1	
Diabetes Mellitus					0.927*
Yes	93.47	34.99	48.7	188	
No	92.75	28.54	50.8	195.1	
Cardiopathy					0.316*
Yes	103.26	25.54	77.9	157.9	
No	91.64	31.11	48.7	195.1	
Hypothyroidism					0.097*
Yes	109.87	48.55	63.3	195.1	
No	90.78	27.24	48.7	188.0	

Table 3 – Cont.

Variables	NAS Score				P value
	Mean	SD	Minimum	Maximum	
Dyslipidemia					0.827*
Yes	96.26	53.11	50.8	172.95	
No	92.79	29.34	48.7	195.1	
Number of comorbidities					0.027†
None	87.25	15.92	72.3	123.7	
One	85.57	17.32	48.7	118.5	
Two	86.08	25.69	50.8	183.0	
Three or more	110.78	43.58	63.3	195.1	
Complications					0.308†
Oncological	87.88	21.38	48.7	157.9	
Metabolic	95.53	37.72	63.2	195.1	
Pulmonary	112.28	42.61	76.9	183.0	
Infectious	81.21	19.47	59.3	113.9	
Cardiovascular	119.85	55.79	72.5	188.0	
Cardiopulmonary	75.17	16.34	50.8	85.6	
Heart	90.5	4.61	85.3	94.1	
Surgical	87.65	6.29	92.1	92.1	
Neurological	111.2	-	111.2	111.2	
No report	87.37	6.94	77.9	94.6	
Outcome					
Discharge	86.09	25.08	48.7	188.0	0.009*
Death	105.92	35.98	59.3	195.1	

Source: Elaborated by the authors.
* Student t test. †One-way ANOVA.

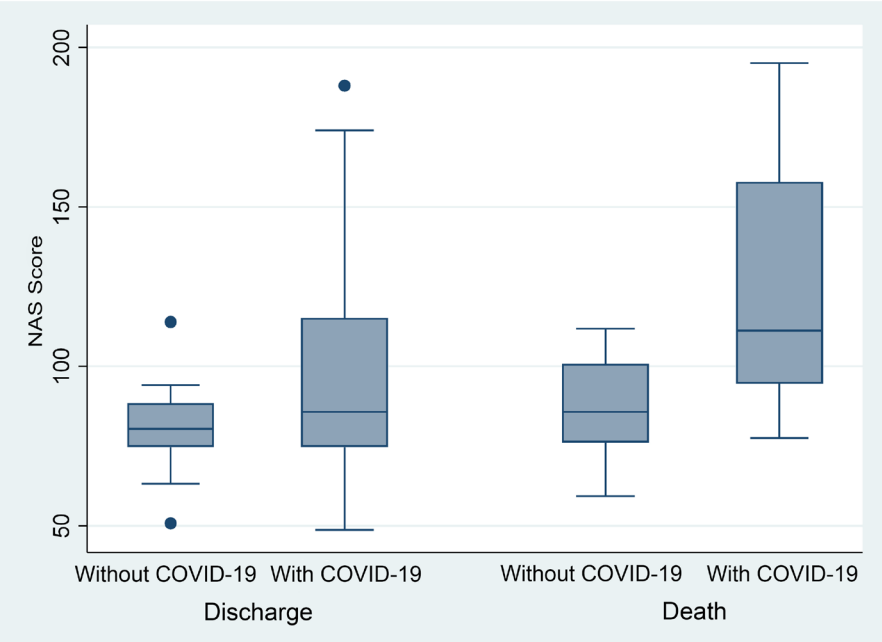

Figure 1 – Representative Boxplot of the NAS score in participants with and without COVID-19, depending on the outcome of hospital admission (n=69). Rio de Janeiro, Rio de Janeiro, Brazil, 2020
Source: Elaborated by the authors.

Table 4 – Multiple linear regression model, considering the NAS score and explanatory variables as the outcome: sociodemographic and clinical characteristics of the participants (n=69). Rio de Janeiro, Rio de Janeiro, Brazil, 2020

Variables	B coefficient	CI95%		p-value*
Diagnosis of COVID-19	29.509	16.020	43.169	<0.001
Undergoing clinical treatment	20.539	3.848	37.230	0.017
Acute respiratory failure by COVID-19 as the reason for hospitalization	38.180	4.021	72.339	0.029
Constant	67.727	44.348	89.106	<0;001

Source: Elaborated by the authors.
* P-value of the model = 0.004; R^2=26.01%.

DISCUSSION

The present study aimed to evaluate the nursing workload in cancer patients, in the context of the COVID-19 pandemic. It was found that the presence of this infection and the need for hospitalization in the acute phase of the disease increased the NAS score in cancer patients.

It was also found that the study population faces a high workload, regardless of the COVID-19 infection. In general, the mean NAS Score was 92.99 (±30.58), which suggests that one nursing professional to every patient with COVID-19 is recommended.

These mean values obtained for the score were higher than those of several studies carried out in ICUs published in the national literature, which demonstrated a relationship with the complexity of patients with cancer and COVID-19, and they increased the demand for nursing care beyond the demand expected for the unit[5, 12]. It was found that

the mean NAS value was close to the values of another study that obtained a mean score of 82.0 %[5]. However, infectious complications were not the ones that prevailed in the study sample.

During the COVID-19 pandemic, new factors can directly influence the nursing workload: patients with COVID-19 required prophylactic measures to prevent or contain the spread of the virus to other patients, such as the use of protective clothing, specific decontamination procedures, isolated areas for the storage of specific supplies. These measures increased the workload of the nursing staff[14], not only because of the time required for implementation, but also because of organizational and management issues. Preliminary reports carried out in Europe revealed an increase of approximately 33% in the nursing workload in this scenario[15].

These findings generated an important reflection on the sizing of the unit's personnel. Considering the average NAS score obtained in this study, 25 hours of nursing care were required per cancer patient diagnosed with COVID-19 in the 24 hours and 19 hours of care for each cancer patient without the infection. This high workload can imply an overload on the nursing team, if there is no adequate dimensioning, which becomes even more problematic in the pandemic context, since COVID-19 leads to an increase in ICU admissions[14].

In general, in various studies on the subject, the average number of nursing professionals calculated by the NAS was higher than the average number of professionals required by the legislation. Even in an ICU with the same specificity, large differences in the mean NAS Score were observed. Therefore, the patient's profile, as well as that of the institution, has its particularities, demanding different care times and, consequently, divergences in the sizing arise, showing that standardized figures provide an inadequate dimensioning[16].

Analysis of the patients' profile revealed a higher percentage of women. The prevalence of female patients with gynecological cancers can be explained by the characteristics of the study site, that is, an oncological unit dedicated to gynecology and Connective Bone Tissue (CBT) tumors. The information corroborates the statistics on gynecological cancer, which indicate that cervical cancer was the fourth most frequent cancer worldwide, with a prevalence of 570,000 new cases, representing 3.2% of all cancers. In turn, endometrial cancer is the sixth most frequent cancer among women, followed by ovarian cancer[1].

The study also showed that elderly men demanded a greater nursing workload. Elderly people make up 12% of the world's population, and that number is expected to double by 2050 and triple by 2,100. Greater longevity can be considered a success story for humanity[17]. In addition, population growth and aging are the biggest contributors to the increase in the total number of cancer cases, especially in the context of countries in economic development, such as Brazil[18]. It is also suggested that advanced age would be associated with the rapid evolution of COVID-19[19]. A study carried out in China, for example, showed that the advanced age of cancer patients was an important risk factor for serious events caused by COVID-19[20].

Important reflections can be made on public health policies targeted to the elderly, in order to ensure a third age with minimal health conditions[18]. An efficient health care model for the elderly must have a well-designed flow of education actions, health promotion, prevention of preventable diseases, recovery from diseases, among others. This line of care begins with the search, welcoming and monitoring of the elderly and only ends in the final moments of life[19,21].

The results obtained also showed the presence of comorbidities in all cancer patients, a broader finding than those of international studies that reported the presence of at least one comorbidity in a little more than half of the patients with COVID-19 in ICU in 2021[3]. In this regard, the literature highlights that, in the context of cancer patients, the presence of comorbidities is an important negative prognostic factor for this clientele, with relevant effects on the treatment and mortality of these patients[5]. Thus, it is urgent to consider that the presence of comorbidities should influence decision-making by the health team, aiming at possible and even still unknown outcomes, due to infection by COVID-19[5].

Nevertheless, the sociodemographic and clinical characteristics investigated in this study did not influence the occurrence of COVID-19, and the NAS scores were not statistically different, with regard exclusively to sex, age group, education, marital status and the number of children, in both groups of patients. In this context, issues related to gender and schooling have been significantly associated with the health conditions of individuals in general. Moreover, the literature points out that the educational level reveals differences in income and health status, showing that the higher the level of education, the greater the chances of a better income and the lower the chance of getting sick[22]. However, these factors were not relevant in the context of cancer patients with COVID-19.

As for the clinical aspects of patients in intensive care, the literature reveals that the most common complication in cancer patients that requires intensive care is sepsis, with an incidence up to four times higher in cancer patients than in other types of patients[23]. However, the data obtained in this study showed other complications that are related to the oncological disease itself.

Respiratory diseases, neoplasms, heart disease, hypertension and diabetes increase the lethality of the disease caused by the new coronavirus. However, cancer patients are at higher risk than the general population in their response to COVID-19, evolving to high fatality rates[3]. However, there are numerous challenges related to the prevention and control of COVID-19, and many questions still need to be answered by science.

The clinical and pathophysiological characteristics of cancer patients contributed to the need for intensive support, at some point, during the evolution of the disease. In the context of the different scenarios that cause cancer patients to be admitted to ICU, it was found that recent advances have reduced mortality, even in populations at risk, such as those undergoing ventilation[23], which means that this will be increasingly common for these patients.

In short, in the context of the COVID-19 pandemic, safety in patient care remains one of the main concerns of nursing managers, in addition to being a challenge to guarantee care with minimal risks[2]. In this regard, scenarios such as the pandemic, require, even more, that ICU managers ensure optimization in the allocation of resources, especially in nursing.

The limitations identified are related to obtaining data from medical records, that is, produced by different professionals in uncontrolled care conditions, and to the small sample size (a small group of cancer patients was included). However, it is understood that the findings can provide a contribution to the discussions related to the proper sizing of the nursing team in this context.

Despite its limitations, the present study intends to contribute, as follows: in management, recommending the NAS as a tool to indicate the nursing workload; in teaching, based on critical reflections on the workload during nursing education; and in research, offering subsidies for the emergence of new studies in the area. Furthermore the development of multicenter studies to evaluate different scenarios of intensive care units, with larger samples, is suggested.

CONCLUSION

The present study concluded that cancer patients diagnosed with COVID-19 required more nursing hours than those without this diagnosis. Statistical analysis of the measurement of the nursing workload was applied to cancer patients, who were separated into groups with and without COVID-19 infection. In addition, it was proved that the workload of the nursing team was high in the context of cancer patients in an intensive care unit, regardless of sociodemographic and clinical aspects. This finding exposed the need for a 1/1 nurse-patient relationship in the context of COVID-19, which reveals highly complex care that demands many hours from professionals.

These findings are expected to make health and nursing managers aware of the need to use tools such as the Nursing Activities Score as a strategy to assess the nursing workload, in order to guide the proper sizing of the team in the context of oncological patients hospitalized in intensive care units, especially when infected with COVID-19.

Finally, it should be noted that the results described here must be considered with caution and within the limits imposed by analyzes based on records of a small sample of patients, which may not reflect the reality of many health services in Brazil.

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The authors declare that there is no conflict of interest.

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Associate editor:
Dagmar Elaine Kaiser

Received: 12.22.2021
Approved: 06.20.2022

Editor-in-chief:
Maria da Graça Oliveira Crossetti

BY-NC

Erratum of article:

Lima VCGS, Pimentel NBL, Oliveira AM, Andrade KBS, Santos MLSC, Fuly PSC. Nursing workload in oncological intensive care in the COVID-19 pandemic: retrospective cohort. *Rev Gaúcha Enferm*. 2023;44:e20210334. doi: https://doi.org/10.1590/1983-1447.2023.20210334.en

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