Functionality of Individuals with Oncological Disease Admitted to Intensive Care Units

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Funcionalidade de Indivíduos com Doença Oncológica Internados em Unidades de Terapia Intensiva

Funcionalidad de los Individuos con Enfermedad Oncológica Internados en Unidades de Cuidados Intensivos

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ABSTRACT

Introduction: Individuals with cancer represent approximately 20% of all intensive care admissions. The reduction in functional capacity results from cancer and its treatments, and can be potentialized by immobilization caused by the disease. **Objective:** To analyze the functionality of individuals with oncological disease admitted to intensive care units. **Method:** Observational prospective cohort study, where individuals with cancer admitted to intensive care units were evaluated within 24 hours of admission and discharge when this occurred. The sociodemographic conditions were obtained through the application of a questionnaire utilizing the Perme scale, and clinical information was collected from the medical charts. Data were analyzed using descriptive and inferential statistics. The *t* test was applied for paired and independent samples. To correlate the quantitative variables, the Pearson correlation test was used. **Results:** 42 critically ill cancer patients were included, predominantly males with mean age of 62.86 years. The main tumor type identified was of the gastrointestinal system (40.5%). Mechanical ventilation was indicative of lower functionality. Significant associations were recorded between length of stay and functionality at admission and discharge. The outcome of patients with lower functionality at admission was death. When comparing the admission and discharge results, there was a significant improvement in functional status. **Conclusion:** Individuals with cancer admitted to intensive care units showed improved functionality during hospitalization.

Key words: Functional Status; Neoplasms/complications; Intensive Care Units; Early Ambulation; Physical Therapy Services.

RESUMO

Introdução: Indivíduos com câncer representam cerca de 20% de todas as admissões em unidades de terapia intensiva. A redução da capacidade funcional é resultante do câncer e seus tratamentos e pode ser potencializada pela imobilização advinda neste setor. **Objetivo**: Analisar a funcionalidade de indivíduos com doença oncológica internados em unidades de terapia intensiva. **Método**: Estudo observacional de coorte prospectiva, no qual foram avaliados indivíduos com câncer, internados em unidades de terapia intensiva dentro de 24 horas da admissão e da alta quando esta ocorreu por meio da escala *Perme*. As condições sociodemográficas foram coletadas com a aplicação de um questionário e as informações clínicas obtidas do prontuário. Os dados foram analisados por estatística descritiva e inferencial. Foi aplicado o teste *t* para amostras pareadas e independentes. Para correlacionar as variáveis quantitativas, foi utilizado o teste de correlação de *Pearson*. **Resultados**: Foram incluídos 42 indivíduos com câncer em estado crítico, predominantemente homens e com média de idade de 62,86 anos. O principal tipo tumoral identificado foi no sistema gastrointestinal (40,5%). A ventilação mecânica foi indicativa de menor funcionalidade. Foram registradas associações significativas entre o tempo de internação e a funcionalidade na admissão e alta. O desfecho dos pacientes admitidos com menor funcionalidade foi o óbito. Ao comparar os resultados de admissão e alta, houve melhora significativa do estado funcional. **Conclusão**: Os indivíduos com câncer admitidos em unidades de terapia intensiva apresentaram melhora da funcionalidade durante a internação.

Palavras-chave: Estado Funcional; Neoplasias/complicações; Unidades de Terapia Intensiva; Deambulação Precoce; Serviços de Fisioterapia.

RESUMEN

Introducción: Las personas con cáncer representan el 20% de los ingresos a unidades de cuidados intensivos. La reducción de la capacidad funcional es el resultado del cáncer y sus tratamientos, y puede empeorar debido a la inmovilización causada en este sector. **Objetivo:** Analizar la funcionalidad de individuos con cáncer internados en unidades de cuidados intensivos. **Método:** Estudio de cohorte prospectivo observacional, en el que se evaluaron individuos con cáncer internados en unidades de cuidados intensivos dentro de las 24 horas posteriores al ingreso y al alta de cuando esto ocurrió mediante la escala de *Perme*. Se recogieron datos sociodemográficos e informaciones clínicas a través de un cuestionario y de registros médicos, respectivamente. Los datos fueron analizados mediante estadística descriptiva e inferencial. Se aplicó la prueba t para muestras pareadas e independientes y la prueba de correlación de Pearson para las variables cuantitativas. **Resultados:** Se incluyeron 42 pacientes predominantemente masculinos y con una edad promedio de 62,86 años. El principal tipo de tumor fue del sistema gastrointestinal (40,5%). La ventilación mecánica fue indicativa de menor funcionalidad. Había asociaciones significativas entre la duración de la estancia en la unidad de cuidados intensivos y la funcionalidad al ingreso y al alta. Los pacientes con menor funcionalidad al ingreso tuvieron como resultado la muerte. Al comparar los resultados de ingreso y alta, hubo una mejora significativa en el estado funcional. **Conclusión:** Los individuos con cáncer ingresados en unidades de cuidados intensivos mostraron mejor funcionalidad durante su estancia.

Palabras clave: Estado funcional. Neoplasias/complicaciones. Unidades de Cuidados Intensivos; Ambulación Precoz; Servicios de Fisioterapia.

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INTRODUCTION

Individuals with cancer account for nearly 20% of the admissions to intensive care units (ICU)[1]. The objective of the admissions is to manage subjacent physiopathological disorders as post-operation status, sepsis and respiratory failure, in addition to specific malignancy-related issues, including organic dysfunctions due to expansive or infiltrative cancer, oncologic emergencies, chemotoxicity, radiotoxicity, tumor lysis syndrome among others[2-4].

Fatigue and reduction of functional capacity arise from cancer and its treatments[5]. In addition, immobilization caused by length of stay at the ICU creates complications as severe disorders of the osteomioarticular and respiratory system as muscle weakness and respiratory immobility resulting from mechanic ventilation (MV), which damages the neuromuscular activation and consequently, the muscle function, with deterioration of the diaphragmatic force and possibly weaning[6,7].

With the advance of technology, death of patients with cancer at ICU declined, however, for those with acute functionality and organ dysfunction, the reduction of mortality is less evident[8]. Therefore, the evaluation of the functionality of this population is important to provide diagnostic and prognostic information for research and clinical practice[9].

The present study aims to analyze the functionality of individuals with oncologic disease admitted to ICU.

METHOD

Prospective cohort observational study evaluating individuals admitted to an ICU of a high complexity hospital at the countryside of the State of Rio Grande do Sul, Brazil. In general, ICU offer 40 beds.

This study is part of a larger study titled "Functionality and health conditions of ICU inpatients", approved by the Institutional Review Board (IRB) of the hospital and by the IRB of "*Universidade de Passo Fundo*", report number 5.379.902 (CAAE (submission for ethical review): 57717222.3.0000.5342) in compliance with the Declaration of Helsinki and Directive 466/12[10] of the National Health Council for studies with human beings. The participants or their legal responsible signed the Informed Consent Form (ICF), were briefed about the study and their doubts have been clarified.

The inclusion criteria were 18-years or older individuals diagnosed with cancer, admitted to the ICU for more than 24 hours.

Approximately 20% of the individuals admitted to the ICU are diagnosed with cancer according to the literature[1]. The study sample consisted in 42 critically ill individuals with cancer, the sample size is compatible with the period when data were collected from April to September 2022.

In this period, the patients received physiotherapy treatment daily. Seven reviewers physiotherapists have been trained previously to apply the evaluation protocols addressed herein. After the individuals or their legal guardian signed the ICF, data were collected in two time points: until 24 hours from admission to ICU and until 24 hours after ICU discharge when it occurred. Individuals whose outcome was death were evaluated at the admission only.

A sociodemographic questionnaire collected data on age, sex, ethnicity and marital status. Clinical data as length of stay at the ICU, tumor site, metastases, oncologic treatment performed, ventilatory support, renal replacement therapy (RRT) and outcome of discharge or death were obtained from the patient's chart.

The 15-items Perme Intensive Care Unit Mobility Score[11] grouped in seven categories was applied to evaluate the functionality: mental state, potential barriers to mobility, functional strength, supportive ambulation devices and endurance measure. The final score ranged from 0 to 36 points, the higher the score, better is the functionality.

The data were coded and stored in a database of the software IBM SPSS Statistics[12] 20.0. and analyzed through descriptive and inferential statistics. The qualitative variables were presented as univariate frequency distribution (absolute and relative) and the quantitative were described by measures of central tendency (mean) and variability (standard-deviation).

The paired samples *t* test was utilized to compare the scores of the domains and final score of the Perme Intensive Care Unit Mobility Score[11] at ICU admission and discharge. The independent samples *t* test[13] was applied to relate the qualitative variables to the final score of functionality and Pearson's correlation[14] was utilized to correlate the quantitative variables (age and length of hospital stay) to the final score of functionality of the Perme scale, respectively. The level of significance adopted was $p < 0.05$.

RESULTS

During data collection, 164 individuals were evaluated, 122 were excluded (19 did not accept to join the study and 103 had no diagnosis of oncologic disease). Eventually, the final sample consisted in 42 individuals (Figure 1).

The mean age of the sample was 62.86 ± 16.59 years, predominantly males (54.8%), White, living with spouses. The mean time of hospital stay was 9.45 ± 12.03 days. The most prevalent neoplasms were of

the gastrointestinal, bone and central nervous systems, lung and mediastinum, prostate and head and neck, respectively. No hematological neoplasms were found in the sample, surgery was the most common oncologic treatment and the majority of the participants had no metastasis, did not use ventilatory support or needed RRT. The mortality rate was 21.4% (Table 1).

Individuals improved all the domains of functionality of the Perme Intensive Care Unit Mobility Score at ICU discharge compared to admission and of the final score of the questionnaire, except the domains "mental state" and "endurance activity" (Table 2).

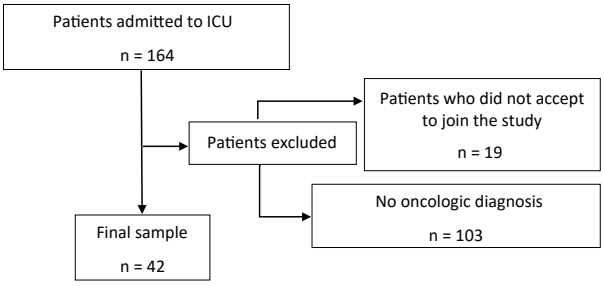

Figure 1. Flowchart of sample selection
Caption: ICU = intensive care units.

Proportional inverse correlation was found between the level of functionality and length of hospital stay both at ICU admission and discharge. There was no correlation between functionality and age (Table 3).

Individuals with neoplasms of the gastrointestinal system had higher functionality rate compared to individuals with other types of tumor at ICU admission, but those with bone and central nervous system tumors had lower functionality rates than other types of tumor at ICU admission and discharge. Patients who utilized ventilatory support had lower functional level at admission and discharge. In addition, death was the outcome of the individuals with lower functional level at admission. (Table 4).

DISCUSSION

The functionality of inpatients with oncologic disease while at the ICU improved, with a reverse proportional correlation between functionality and length of hospital stay at admission and discharge as found in the present investigation.

In addition, MV was predictor of low functional capacity and death was the outcome for patients with worst functional condition at admission. Individuals with gastrointestinal system neoplasms had higher functionality at ICU admission and patients with

Table 1. Characterization of individuals with oncologic disease admitted to ICU. Passo Fundo, RS, 2022

Variables	Mean and Standard deviation
Age (mean ± standard deviation), years	62.86 ± 16.59
Sex [n (%)]	
Male	23 (54.8)
Female	19 (45.2)
Color [n (%)]	
White	39 (92.9)
Non-White	03 (7.3)
Marital status [n (%)]	
With spouse	27 (64.3)
Without spouse	06 (14.3)
Length of stay at the ICU in days	9.45 ± 12.03
Tumor location [n (%)]	
Gastrointestinal system	17 (40.5)
Bone system	05 (11.9)
Central nervous system	05 (11.9)
Lung and mediastinum	05 (11.9)
Prostate	04 (9.8)
Head and neck	03 (7.1)
Others	08 (19.0)
Oncologic treatment [n (%)]	
Did not submit to oncologic treatment	05 (11.9)
Surgery	26 (61.9)
Chemotherapy	21 (50.0)
Radiotherapy	09 (21.4)
Metastasis [n (%)]	
No	36 (85.7)
Yes	06 (14.3)
Death [n (%)]	
No	33 (78.6)
Yes	09 (21.4)
Ventilatory support [n (%)]	
Did not need	26 (61.9)
Non-invasive mechanic ventilation	02 (4.8)
Invasive mechanic ventilation	14 (33.3)
Renal replacement therapy [n (%)]	
No	37 (88.1)
Yes	05 (11.9)

Captions: n = absolute value; % = relative value; ICU = intensive care unit.

Table 2. Functionality of individuals with oncologic disease admitted to ICU. Passo Fundo, RS, 2022

Domains	Admission (n = 33)	Discharge (n = 33)	$CI_{95\%}$	*p*
Mental state	2.42 ± 1.09	2.82 ± 0.72	-0.809 – 0.21	0.062
Barriers to mobility	1.55 ± 0.93	2.15 ± 0.97	**-0.982 – -0.231**	**0.004**
Functional strength	3.03 ± 1.46	3.58 ± 1.03	**-1.048 – -0.043**	**0.045**
Mobility at bed	2.55 ± 2.63	3.97 ± 2.05	**-2.466 – -0.383**	**0.005**
Transferences	2.48 ± 3.48	5.09 ± 3.48	**-4.097 – -1.115**	**0.000**
Gait	0.70 ± 1.26	1.18 ± 1.31	**-0.979 – -0.010**	**0.018**
Endurance activity	0.42 ± 0.90	0.64 ± 0.89	-0.474 – 0.050	0.161
Total	13.15 ± 9.27	19.42 ± 8.38	**-9.499 – -3.047**	**0.000**

Captions: mean ± standard deviation; n = absolute value; $CI_{95\%}$ = confidence interval; ICU = intensive care units; values in bold ($p < 0.05$).

Table 3. Correlation between functionality and length of hospital stay in individuals with oncologic disease admitted to the ICU. Passo Fundo, RS, 2022

	Admission		Discharge	
Correlations	**ρ**	***p***	**ρ**	***p***
Functionality *vs.* age	0.150	0.344	0.289	0.103
Functionality *vs.* length of hospital stay	– 0,322	**0,037**	– 0,532	**0,001**

Captions: values in bold ($p < 0.05$); ρ (correlation coefficient).

bone and central nervous system tumors presented low scores of functionality at admission and discharge, respectively.

The number of individuals living with cancer is growing due to treatment innnovations[15]. However, cancer and modalities of treatment complications are common in the course of the disease[16] and can overburden the ICU[4].

Individuals with oncological disease in the current study accounted for 25.60% of the total patients admitted to the ICU investigated corroborating the current literature[1, 17, 18], which found 20% of inpatients diagnosed with cancer. However, these admissions can be reduced due to the implementation of palliative care in individuals with advanced cancer[19].

The mean age of the participants was 62.86±16.59 years similar to other studies[3,20-22], a finding that can be related to the increase of world incidence of cancer provoked by the rising life expectancy and high level of comorbidity, fragility, ageing-related physiological changes that can complicate cancer treatments. In addition, among these ageing-related changes, biophysical modifications on the extracellular matrix, alterations of secreted factors and immune system stand out and contribute to tumor permissive microenvironment[23,24].

No correlation between the level of functionality and age of individuals with cancer admitted at ICU at admission and discharge was found. Nevertheless, it is known that the functional decline can be predicted not only by advanced age but other characteristics of the patient, of the disease and treatment-related factors[25].

Males were the majority of the study sample (54.8%), consistent with other studies[22,25,26], which found prevalence of men in their samples, formed or not by individuals with cancer. This scenario reflected on the estimates of 983,160 new cases of cancer in men for 2022, higher than females with 934,870 new cases[27].

The reasons underlying this fact are not well clarified but can be related to poor selfcare, further to high exposure to environmental and biological factors as smoking and males and females different endogenous hormones, function and immune responses[28].

The mean time of length of stay at the ICU was 9.45±12.03 days, higher than an approximate time of three days described by other authors[3] but lower than 30 days found in another study[29].

The differences between length of stay at the ICU can vary according to the elective or urgent nature of the admission, severity of the clinical condition, necessity of ventilatory support or RRT[3] and can be related to the functionality of the individual at the admission as demonstrated herein.

An inversely proportional correlation between functionality and length of stay at ICU admission and discharge was found in the present study. It is understood that individuals admitted to the ICU with worst functional condition were hospitalized for more time and, at discharge, their level of functionality was lower still compared to those whose length of stay was shorter. The longer the ICU stay, higher is the functional decline and lower functionality at discharge as other authors have concluded as well[26,30-32].

Table 4. Relation among functionality and clinical and sociodemographic variables of individuals with cancer admitted to ICU. Passo Fundo, RS, 2022

Functionality (mean ± standard deviation)				
Sex				
	Male	Female	$CI_{95\%}$	*p*
ICU admission (n=42)	11.04 ± 10.74	10.42 ± 8.54	-5.526 – 6.771	0.835
ICU discharge (n=33)	20.69 ± 7.88	18.24 ± 8.89	-3.509 – 8.413	0.408
Color				
	White	Non-White	$CI_{95\%}$	*p*
ICU admission (n=42)	11.34 ± 9.75	2.67 ± 3.78	-2.840 – 20.276	0.135
ICU discharge (n=33)	19.53 ± 8.49	–	–	–
Marital status				
	With spouse	Without spouse	$CI_{95\%}$	*p*
ICU admission (n=42)	11.85 ± 10.18	8.80 ± 8.72	-3.025 – 9.129	0.314
ICU discharge (n=33)	19.59 ± 8.47	19.09 ± 8.59	-5.911 – 6.911	0.875
Gastrointestinal system neoplasm				
	No	Yes	$CI_{95\%}$	*p*
ICU admission (n=42)	7.84 ± 8.59	15.06 ± 9.86	-13.014 – -1.423	0.016
ICU discharge (n=33)	17.79 ± 8.85	21.64 ± 7.42	-9.651 – 1.944	0.185
Bone cancer				
	No	Yes	$CI_{95\%}$	*p*
ICU admission (n=42)	11.65 ± 9.84	4.20 ± 5.45	0.720 – 14.177	0.034
ICU discharge (n=33)	19.90 ± 8.58	14.67 ± 4.16	-2.724 – 13.191	0.142
Central nervous system cancer				
	No	Yes	$CI_{95\%}$	*p*
ICU admission (n=42)	11.74 ± 9.60	7.20 ± 10.73	-5.323 – 13.409	0.388
ICU discharge (n=33)	20.72 ± 7.73	10.00 ± 7.48	2.334 – 19.114	0.014
Lung and mediastinum cancer				
	No	Yes	$CI_{95\%}$	*p*
ICU admission (n=42)	11.08 ± 9.74	8.40 ± 10.04	-6.735 – 12.097	0.568
ICU discharge (n=33)	19.67 ± 8.45	17.00 ± 8.88	-7.805 – 13.138	0.607
Prostate cancer				
	No	Yes	$CI_{95\%}$	*p*
ICU admission (n=42)	10.85 ± 9.82	9.67 ± 9.60	-10.703 – 13.062	0.842
ICU discharge (n=33)	19.23 ± 8.61	22.50 ± 0.70	-6.608 – 0.060	0.054
Head and neck cancer				
	No	Yes	$CI_{95\%}$	*p*
ICU admission (n=42)	10.93 ± 9.76	7.50 ± 10.60	-10.911 – 17.761	0.632
ICU discharge (n=33)	19.39 ± 8.46	20.00 ± 8.89	-74.725 – 73.499	0.945
Surgery				
	No	Yes	$CI_{95\%}$	*p*
ICU admission (n=42)	11.00 ± 10.61	11.54 ± 9.89	-7.916 – 6.869	0.883
ICU discharge (n=33)	20.00 ± 10.93	19.15 ± 8.16	-6.622 – 8.322	0.817

to be continued

Table 4. continuation

Chemotherapy				
	No	Yes	$CI_{95\%}$	*p*
ICU admission (n=42)	11.31 ± 11.35	11.43 ± 9.05	-6.924 – 6.692	0.973
ICU discharge (n=33)	18.09 ± 9.62	20.22 ± 8.64	-9.213 – 4.950	0.542
Radiotherapy				
	No	Yes	$CI_{95\%}$	*p*
ICU admission (n=42)	12.61 ± 10.34	7.56 ± 8.00	-1.913 – 12.016	0.145
ICU discharge (n=33)	20.59 ± 8.85	15.71 ± 8.71	-2.977 – 12.720	0.214
Metastasis				
	No	Yes	$CI_{95\%}$	*p*
ICU admission (n=42)	11.28 ± 10.03	19.17 ± 8.68	-5.062 – 12.284	0.316
ICU discharge (n=33)	7.67 ± 7.23	21.25 ± 6.29	-11.310 – 7.155	0.584
Death				
	No	Yes	$CI_{95\%}$	*p*
ICU admission (n=42)	13.15 ± 9.27	2.00 ± 5.26	**6.128 – 16.085**	**0.000**
ICU discharge (n=33)	19.42 ± 8.38	–	–	–
Ventilatory support				
	No	Yes	$CI_{95\%}$	*p*
ICU admission (n=42)	15.54 ± 7.97	3.00 ± 6.87	**7.825 – 17.252**	**0.000**
ICU discharge (n=33)	21.68 ± 7.78	12.38 ± 6.02	**3.560 – 15.050**	**0.004**
Renal replacement therapy				
	No	Yes	$CI_{95\%}$	*p*
ICU admission (n=42)	10.89 ± 9.55	9.80 ± 11.90	-10.485 – 10.069	0.817
ICU discharge (n=33)	18.87 ± 8.49	25.00 ± 5.19	-7.488 – 12.488	0.161

Captions: mean ± standard deviation; n = absolute value; CI95% = confidence interval; ICU = intensive care units; values in bold ($p < 0.05$).

Gastrointestinal neoplasm was the main tumor type identified in 40.5% of the sample, also corroborated by the literature[3]. It is known that colorectal cancer is the most common tumor type of the gastrointestinal system, its treatment can be debilitating and surgery is the modality of choice with or without adjuvant therapy.

Surgery is associated with pain, sleep disorders, fatigue, nausea, vomits and inactivity that affect functionality[33]. However, it was found that individuals with this type of tumor had better functionality scores than individuals with other tumors at ICU admission, consistent with the literature, that identified that patients with gastric and colorectal cancer had lower functional capacity when compared with other tumor types[34]. In addition, a study investigated the functionality pre and post operation of older patients with colorectal cancer and did not find post-surgery functional decline[35].

In this study, individuals with bone tumor were in worse functional condition than individuals with cancer without bone tumors at ICU admission, possibly justified by extensive musculoskeletal compromise caused by the surgical approach, a priority treatment quite often combined with adjuvant and neoadjuvant chemotherapy or radiotherapy[36]. Additionally, along the hospitalization, the functionality of these individuals improved and at discharge, no difference between the functionality of patients with or without bone tumors was found.

At ICU discharge, individuals with central nervous system neoplasms had better functionality than individuals without this tumor, a result potentially affected by many factors in addition to ICU associated immobility as topography of the lesion, rate of disease growth and duration, malignancy level, age of the patient and type of treatment applied. And the lesions on the frontal lobe (approximately 26%) can cause paresthesia of the limbs, apraxia and gait disorders provoking deterioration of the functionality[37]. Therefore, it is understood that, although the individuals had functionality level similar to other individuals at admission, these did not evolve in their functional status as much as their pairs due to the complications of this type of cancer.

No relation between the level of functionality of individuals with oncologic disease and types of treatment performed was found both at ICU admission and discharge. Long-term effects are debilitating to the functionality because, although the extension of the treatment has not been evaluated, the literature investigates the late effects of cancer treatment, addressing, for instance, functional sequelae provoked by long and/or mutilating surgeries and their persistent symptoms[4].

Only 14.3% of the patients had metastasis, but other studies identified 27% and 18.7%[9,17]. In addition, no relation between the level of individuals with cancer and metastasis was found both at admission and discharge. Given the disproportionality of patients with primary cancer and patients with metastasis and that the implementation of palliative care can reduce the number of admission of patients with advanced cancer[9], it is clear the similarity of the level of functionality among individuals with or without metastasis.

There was a significant mortality reduction of individuals with cancer in ICU along the years, but less evident for those with higher organ dysfunctions and functionality decline[8] similar to the present study because individuals with cancer whose outcome was death (21.4% of the sample) had lower functionality at admission to ICU. In addition, the present findings corroborate an investigation that analyzed the functionality of individuals with COVID-19 admitted to the ICU, where those whose functionality did not improve during hospital stay died[31].

The majority of the study sample did not submit to RRT (11.9%), similar to another study where 4% of critically ill patients with cancer with acute kidney injury (AKI) needed RRT while in ICU[38]. AKI in these patients results from cancer (obstruction of the urinary tract, acute tumor lysis syndrome), anti-cancer treatments (drug-induced nephropathy, major surgical procedures) or severe clinical conditions (sepsis, hypovolemia)[39].

There was no relation between the level of functionality of individuals with oncologic disease and RRT at admission and discharge, although it is known that catabolic factors as acidosis, inflammation, corticosteroids associated with comorbidities and sedentary lifestyle can lead to loss of muscle mass in patients who submit to RRT[39].

MV is one of the items analyzed in the domain "potential barriers to mobility" and during stay in ICU, 33.3% of the individuals evaluated needed MV, consistent with a recent study[27] (39.4%), but higher than the results of other investigations[4] (15.5%) and (18.8%)[40].

Individuals with oncologic disease admitted to ICU had reduced functionality and those who needed MV were those with lower functionality still; invasive mechanic ventilation has been shown as indicative of low functionality at ICU discharge, similar to what other authors concluded in 2022[32], possibly potentialized by prolonged periods of MV[30].

The impact and duration of MV on the functionality is justified by mostly passive respiratory action that leads to reduced neuromuscular activation and deterioration of diaphragmatic force, negatively affecting weaning and extubation[7]. In addition, the frequent and concomitant utilization of sedative and neuromuscular blockers results in immobility and development of muscle weakness while in ICU[41,42]. MV may not only indicate functionality decline but can be a strong predictor of dismal prognosis and mortality of individuals with cancer[17].

Given the functional capacity of the individual with cancer prior to ICU admission, the impact of the length of stay in MV on functionality together with acquired muscle weakness, it is necessary the implementation of safe protocols for early mobilization for this population with the following benefits: reduction of muscle weakness acquired in ICU, improvement of lung volumes and capacity, less time in MV, increase of successful weaning and extubation, reduction of risk and duration of *dellirium*, improvement of functionality and shorter length of hospital stay, promoting beds rotation and less readmissions to ICU[43].

The physiotherapist is the skilled professional to provide early mobilization and rehabilitation of the ICU inpatient, promoting improvement of motor functional capacity and respiratory status for long-term reinsertion of the individual in the society after hospital discharge and improvement of the quality of life[44]. The role this professional plays in ICU jointly with skilled multiprofessional team may have been the major positive factor responsible for the improvement of the functional capacity of critically ill patients investigated herein.

The evaluation and revaluation of the individuals made by the same reviewer is a limitation of the study. However, the professionals responsible for data collection were previously trained to minimize potential biases and the generation of data and dissemination of knowledge was not jeopardized.

CONCLUSION

The functionality of individuals with cancer was low when they were admitted to the ICU, however, it improved during their stay. Inpatients in ventilatory support and longer length of hospital stay had low levels of functionality. Eventually, death was the outcome of low functionality at admission. Therefore, protocols of early mobilization should be implemented at the ICU to potentialize the improvement of the functional capacity of individuals with oncologic disease.

CONTRIBUTIONS

All the authors contributed substantially to the study design, acquisition, analysis and interpretation of the data, wording and critical review. They approved the final version to be published.

DECLARATION OF CONFLICT OF INTERESTS

There is no conflict of interests to declare.

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