Association of Mobility with Physical-Functional Condition in Hospitalized Cancer Patients

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Associação da Mobilidade com a Condição Físico-Funcional em Pacientes Oncológicos Hospitalizados

Asociación de la Movilidad con la Condición Físico-Funcional en Pacientes Oncológicos Hospitalizados

Vanessa de Mello Konzen[1]; Matheus Santos Gomes Jorge[2]; Ana Luisa Sant'Anna Alves[3]; Lia Mara Wibelinger[4]

ABSTRACT

Introduction: Mobility is essential for the functional independence of cancer patients, especially during hospitalization. The Johns Hopkins Highest Level of Mobility (JH-HLM) scale provides an objective measure of this ability and has been applied in oncological contexts. Handgrip strength (HGS) reflects muscle strength and nutritional status, while the risk of sarcopenia, characterized by the loss of muscle mass and strength, negatively affects prognosis. **Objective:** To assess mobility and its associations with HGS, risk of sarcopenia, and pre-admission physical activity level in hospitalized cancer patients. **Method:** Observational, descriptive, and cross-sectional study conducted with adults and older adults hospitalized in two hospitals in southern Brazil between December 2024 and July 2025. Mobility was assessed using the JH-HLM; HGS, with a dynamometer; risk of sarcopenia, using the SARC-F combined with calf circumference; and physical activity, through the short IPAQ. **Results:** A total of 210 patients participated, mostly women aged 60 years or older, self-declared white, sedentary, and with muscle weakness. According to the JH-HLM, 87.1% presented high mobility and 12.9% restricted mobility. High mobility was significantly associated with younger age, having a partner, higher physical activity, and lower risk of sarcopenia. After multivariate adjustment, sedentarism (PR=1.084; 95%; CI: 1.001–1.173) and sarcopenia risk (PR=0.905; 95% CI: 0.824–0.993) remained independent predictors. **Conclusion:** Prior physical activity and low risk of sarcopenia favor better mobility in hospitalized cancer patients.

Key words: Motor Skills; Motor Activity; Sarcopenia; Oncology; Hospitalization.

RESUMO

Introdução: A mobilidade é essencial para a independência funcional de pacientes com câncer, especialmente durante a hospitalização. A escala *Johns Hopkins Highest Level of Mobility* (JH-HLM) oferece medida objetiva dessa capacidade e tem sido aplicada em contextos oncológicos. A força de preensão palmar (FPP) reflete a força muscular e o estado nutricional, enquanto o risco de sarcopenia, caracterizado pela perda de massa e força muscular, afeta negativamente o prognóstico. **Objetivo:** Avaliar a mobilidade e suas associações com FPP, risco de sarcopenia e nível de atividade física pré-internação em pacientes oncológicos hospitalizados. **Método:** Estudo observacional, descritivo e transversal, realizado com adultos e idosos internados em dois hospitais do Sul do Brasil entre dezembro de 2024 e julho de 2025. A mobilidade foi avaliada pela JH-HLM; a FPP, por dinamômetro; o risco de sarcopenia, pelo SARC-F associado à circunferência da panturrilha; e a atividade física, pelo IPAQ curto. **Resultados:** Participaram 210 pacientes, em sua maioria mulheres, com 60 anos ou mais, autodeclaradas brancas, sedentárias e com fraqueza muscular. Pela JH-HLM, 87,1% apresentaram mobilidade elevada e 12,9%, restrita. A mobilidade elevada associou-se significativamente à menor idade, presença de companheiro, maior atividade física e baixo risco de sarcopenia. Após ajuste multivariado, o sedentarismo (RP=1,084; IC 95%: 1,001–1,173) e o risco de sarcopenia (RP=0,905; IC 95%: 0,824–0,993) permaneceram preditores independentes. **Conclusão:** A prática de atividade física prévia e o baixo risco de sarcopenia favorecem melhor mobilidade em pacientes oncológicos hospitalizados.

Palavras-chave: Destreza Motora; Atividade Motora; Sarcopenia; Oncologia; Hospitalização.

RESUMEN

Introducción: La movilidad es esencial para la independencia funcional de los pacientes con cáncer, especialmente durante la hospitalización. La escala *Johns Hopkins Highest Level of Mobility* (JH-HLM) proporciona una medida objetiva de esta capacidad y se ha aplicado en contextos oncológicos. La fuerza de prensión manual (FPM) refleja la fuerza muscular y el estado nutricional, mientras que el riesgo de sarcopenia, caracterizado por la pérdida de masa y fuerza muscular, afecta negativamente el pronóstico. **Objetivo:** Evaluar la movilidad y sus asociaciones con la FPM, el riesgo de sarcopenia y el nivel de actividad física previo a la hospitalización en pacientes oncológicos. **Método:** Estudio observacional, descriptivo y transversal, realizado con adultos y personas mayores internados en dos hospitales del sur del Brasil entre diciembre de 2024 y julio de 2025. La movilidad se evaluó mediante la JH HLM; la FPM, con dinamómetro; el riesgo de sarcopenia con el cuestionario SARC-F combinado con la circunferencia de la pantorrilla; y la actividad física con el IPAQ corto. **Resultados:** Participaron 210 pacientes, en su mayoría mujeres de 60 años o más, autodeclarados blancos, sedentarios y con debilidad muscular. Según la JH HLM, el 87,1% presentó movilidad elevada y el 12,9% movilidad restringida. La movilidad elevada se asoció significativamente con menor edad, tener pareja, mayor nivel de actividad física y bajo riesgo de sarcopenia. Tras el ajuste multivariado, el sedentarismo (RP=1,084; IC95%: 1,001–1,173) y el riesgo de sarcopenia (RP=0,905; IC95%: 0,824–0,993) se mantuvieron como predictores independientes. **Conclusión:** La actividad física previa y el bajo riesgo de sarcopenia favorecen una mejor movilidad en pacientes oncológicos hospitalizados.

Palabras clave: Destreza Motora; Actividad Motora; Sarcopenia; Oncología; Hospitalización.

[1-4]Universidade de Passo Fundo (UPF), Programa de Pós-Graduação em Envelhecimento Humano. Passo Fundo (RS), Brasil.
[1]E-mail: 182036@upf.br. Orcid iD: https://orcid.org/0000-0001-5408-9598
[2]E-mail: matheusjorge@upf.br. Orcid iD: http://orcid.org/0000-0002-4989-0572
[3]E-mail: alves.als@upf.br. Orcid iD: https://orcid.org/0000-0002-1107-7471
[4]E-mail: liafisio@upf.com.br. Orcid iD: https://orcid.org/0000-0002-7345-3946
Coresponding author: Vanessa de Mello Konzen. Rua Galvão Costa, 1074, apto. 203 – Centro. Santa Cruz do Sul (RS), Brasil. CEP 96810-198. E-mail: 182036@upf.br

INTRODUCTION

Mobility is an essential factor in the functional independence of patients with cancer, being fundamental for the early detection of changes and the implementation of preventive measures. The Johns Hopkins Highest Level of Mobility[1] (JH-HLM) has been employed as an objective tool to measure and classify mobility levels, helping in the functional assessment of these patients[1]. A study conducted with patients submitted to colorectal cancer surgery observed that mobility can contribute to creating a culture of safe and effective mobilization in the postoperative period[2]. Similarly, in patients with metastatic spinal disease, there was a significant improvement in the JH-HLM scale scores after surgical stabilization, strengthening its clinical applicability[3]. Thus, the JH-HLM assessment has proven promising in the functional assessment and rehabilitation of hospitalized oncological patients.

Although mobility and hand grip strength (HGS) are distinct measurement units, studies suggest a significant association between them in patients with cancer since both depend on muscle function and the ability to perform physical activities. A study conducted by Duarte et al.[4] observed a positive association between HGS and quality of life, indicating that muscle strength reduction can lead to overall weakness, greater dependence on daily activities, and consequent worsening of quality of life. Moreover, HGS has been for a long time a reliable indicator of overall muscle strength and physical function in oncological patients, contributing to a more precise nutritional diagnosis, allowing the identification of malnutrition risk, preventing complications, reducing hospital mortality, and hospitalization time[5]. Patients with lower HGS present higher mortality rates[6].

The complications from cancer and its treatment affect multiple body systems and often result in fatigue, muscle mass loss, and decreased functionality, symptoms associated with sarcopenia[7]. Physical-functional assessment, essential to patient autonomy, allows for identifying more fragile individuals and planning adequate interventions, preventing the negative impacts of oncological treatment on their independence[8].

The sarcopenia risk assessment in hospitalized oncological patients is key to more effective care, since muscle mass and strength loss, aggravated by treatments like chemotherapy, may negatively impact recovery[9]. Specific tools for this assessment enable the identification of patients with a greater risk of postoperative complications and mortality, contributing to the adoption of preventive interventions[10].

In summary, the assessment of physical-functional conditions plays an essential role in the care of oncological patients in the hospital environment. The possible association between mobility and other physical-functional assessments highlights the importance of approaching physical health more comprehensively, considering both overall mobility and hand function, and how these functions generally impact quality of life. However, despite being widely used in clinical practice, the assessment and possible relation between these variables are still not well established in the specific context of the hospital environment in oncological patients.

Assessing mobility and its relationship with other physical-functional condition factors in hospitalized oncological patients is essential to customizing therapeutic interventions, preventing complications, and promoting recovery during hospitalization. Thus, the present study assessed mobility and its association with the physical-functional condition of hospitalized patients for oncological treatment.

METHOD

Observational, descriptive, and cross-sectional study conducted with adult and elderly patients hospitalized for oncological treatment. The research was conducted in two high-complexity reference hospitals located in Southern Brazil, with specialized infrastructure and qualified multiprofessional teams.

Data collection occurred from December 2024 to July 2025, including patients aged 18 or older, both sexes, with a cancer diagnosis, regardless of the time since diagnosis or tumor location. The chosen participants should have been hospitalized at one of the two selected hospitals for at least two days. Patients who presented physical, functional, or mental conditions that could interfere with or impair the application of instruments and tests used in the research, such as patients with severe audiovisual deficiencies, neuromotor sequelae that prevent them from doing the tests, debilitating neurological diseases, or chronic-degenerative diseases in acute phase, were considered ineligible.

A sample size of 171 subjects was calculated to estimate the proportion of low and moderate mobility outcomes with a 15% width for the confidence interval. The calculation considered a confidence level of 95% and 48% of the expected percentage for low and moderate mobility[11]. This calculation was done using the online version of the PSS Health tool[12].

The selected sample was submitted to a single assessment step, conducted in an in-person meeting with an approximate duration of thirty minutes. The participants were invited to integrate the study by presenting and signing a Free and Informed Consent

Form (FICF). Then, the questionnaires were applied, and the proposed assessments were conducted by researchers who were previously trained to apply the instruments and conduct the interviews.

The information was obtained directly from the participants and later checked against the electronic records to ensure the reliability and completeness of the data. Whenever needed, gaps identified in the interviews were complemented with information registered in the patient records.

The mobility outcome was assessed through the JH-HLM[1] scale, a validated instrument that classifies the higher level of mobility reached by the patient during hospitalization. The scale contemplates a level progression, from total bed restriction (level 1) to independent walking over long distances (level 8), enabling objective measurement of the individual's functional capacity in the hospital environment[13].

The other variables investigated are described as follows. The investigated sociodemographic characteristics were sex, age, education, marital status, treatment intention and status, radiotherapy and chemotherapy, and use of continuous medication. HGS was assessed using a manual dynamometer, with three attempts conducted with the dominant hand of each participant. Additionally, cutoff points proposed by the Sarcopenia Definitions and Outcomes Consortium (SDOC), which defines muscle weakness as an HGS lower than 35.5 kg in men and 20 kg in women, were adopted. The choice was based on the literature consensus about the ideal thresholds for HGS assessment in oncological geriatric patients[14].

Sarcopenia risk was assessed using the SARC-F questionnaire, composed of five questions that approach aspects related to strength, mobility, and falls. Each item has three response options, with scores that range from 0 to 2, totaling a final score between 0 and 10, in addition to measuring calf circumference (CC), which attributes a score of 0 when the value is higher than 34 cm for men and 33 cm for women, and a score of 10 when equal to or lower than these values, as proposed by the literature. Scores equal to or higher than 4 indicate increased risk for sarcopenia[15,16].

The level of physical activity was assessed using the international physical activity questionnaire (IPAQ) in its short version. It is worth recalling that this assessment referred to the pre-hospitalization period. The patients were classified as: very active, active, irregularly active, or sedentary[17,18].

The body mass index (BMI) was calculated from the participants' body mass and height records, using the BMI = weight/height² formula. The values obtained were recorded as continuous numerical values and, later, categorized according to the cutoff points established by the Pan American Health Organization for elders. The participants with BMI lower than 23 kg/m² were classified as underweight; those with BMI between 23 and 28 kg/m² were considered eutrophic; values between 28 and 30 kg/m² indicated overweight; and values higher than 30 kg/m² were classified as obesity. This categorization allowed for assessing the nutritional state of the sample in the context of hospitalization[19]. For adults, the World Health Organization classification was used[20], in which values lower than 18.5 kg/m² were considered underweight, between 18.5 and 24.9 Kg/m², eutrophic, between 25 and 29.9 kg/m² were considered overweight, and values equal to or higher than 30 Kg/m² were classified as obesity.

The collected data was typed and analyzed using statistical software[21]. For the qualitative variables, absolute and simple relative frequencies were presented. For the quantitative variables, measurements of central tendency and dispersion were calculated. To answer the study's objective, the chi-square test[22] and Fisher's[23] exact test were applied; then, a multivariate analysis was conducted using Poisson's[24] regression, and prevalence ratios and respective confidence intervals (CI) were calculated. The significance level adopted was 5%.

This research has been approved by the Research Ethics Committee of the *Universidade de Passo Fundo*, report number 7204290 (CAAE (submission for ethical review): 83586824.6.0000.5342), in compliance with Resolution 466/2012[25] of the National Health Council.

RESULTS

The sample was composed of 210 patients, predominantly aged 60 years or older (61.0%), female (50.5%), self-declared white (81.4%), and who did not finish high school (66.7%). The majority reported living with a spouse and were in active oncological treatment, with healing intention, chemotherapy being the most frequent type of treatment. Most cancer diagnoses were head and neck (n=82), followed by gastrointestinal (n=21), skin (n=20), and leukemia (n=15). The others were gynecological, lymphoma, genitourinary, breast, chest, and myeloma.

There was a high proportion of sedentary participants, with muscle weakness and continuous use of medication. Regarding nutritional state, eutrophic patients predominated, although cases of underweight, overweight, and obesity have also been observed. The data presented in Table 1 describes the sociodemographic and clinical profile of the studied population.

Mobility assessment through the JH-HLM classification indicated that most participants presented

Table 1. Description of the sociodemographic characteristics and physical-functional condition of hospitalized patients in oncological treatment in Rio Grande do Sul hospitals, 2024/2025 (n=210)

Variables	Categories	n	%
Sex	Male	104	49.5
	Female	106	50.5
Age group	18 to 59 years old	82	39.0
	60 years and older	128	61.0
Skin color	White	171	81.4
	Non-white	39	18.6
Education	Up to incomplete high school	140	66.7
	Complete high school or higher	70	33.3
Marital status	Has a spouse	127	60.5
	No spouse	83	39.5
Chemotherapy	No	59	28.1
	Yes	151	71.9
Radiotherapy	No	164	78.1
	Yes	46	21.9
Treatment status	Before treatment	11	5.2
	Actively receiving treatment	175	83.3
	Finished treatment	24	11.4
Intention of treatment	Healing	173	84.8
	Palliative	31	15.2
Former smoker	No	140	66.7
	Yes	70	33.3
IPAQ	Sedentary and irregularly active	168	80.0
	Active and very active	42	20.0
HGS	Normal strength	93	44.3
	Muscle weakness	117	55.7
Continuous medication	No	38	18.1
	Yes	172	81.9
BMI	Underweight	45	21.4
	Eutrophic	98	46.7
	Overweight	36	17.1
	Obesity	31	14.8
Sarcopenia	Low risk	89	42.4
	Likely sarcopenia	121	57.6

Captions: IPAQ = international physical activity questionnaire; BMI = body mass index; HGS = hand grip strength.

high mobility levels. A total of 87.1% (n=183) were classified within levels 6 and 8 in the scale, corresponding to the ability to walk small distances of up to 75 meters or more. Only 12.9% (n=27) were classified within levels 1 and 5, indicating mobility restricted to the bed or least effort activities, like sitting down or standing up for brief moments. These results underscore good functional performance of the sample regarding mobility, with a predominance of patients capable of going on longer walks independently.

For the outcome considered in the regression analysis of this study, the sample was divided into reduced mobility and preserved mobility, with a 1-5 classification considered reduced mobility and a 6-8 classification considered preserved mobility.

The analysis of the association between mobility and clinical and sociodemographic variables assessed by the JH-HLM scale revealed significant differences for age group, marital status, physical activity level (IPAQ), and risk of sarcopenia (SARC-F) (p<0.05). Patients aged 60 years or younger presented a greater level of preserved mobility (92.7%) when compared with elderly people (83.6%). Having a spouse was associated with better mobility levels, with 91.3% of participants in this condition classified within the highest scale levels, in face of the 80.7% who had no spouse. The level of physical activity was associated with mobility. Participants classified as active or very active presented 97.6% preserved mobility, while those who had a sedentary lifestyle and were irregularly active presented a rate of 84.5%. Regarding sarcopenia risk, 95.5% of patients with low sarcopenia risk presented high mobility, in contrast with 81% of those with likely sarcopenia. These findings indicate that factors such as age, presence of spouse, physical activity level, and risk of sarcopenia are significantly associated with mobility level in hospitalized patients with cancer. The complete data from the analysis can be observed in Table 3.

In the multivariate analysis (Table 4), an association between physical activity level and sarcopenia risk

Table 2. Description of the mobility of hospitalized patients in oncological treatment in Rio Grande do Sul hospitals, 2024/2025 (n=210)

JH-HLM classification	n	%
1 Lying in bed	3	1.4
2 Bed activities	7	3.3
3 Sitting at edge of bed	5	2.4
4 Transferring to chair	7	3.3
5 Standing up for 1 minute or longer	5	2.4
6 Walking 10 or more steps	42	20.0
7 Walking approximately 7.5 meters or more	55	26.2
8 Walking approximately 75 meters or more	86	41.0

Caption: JH-HLM = Johns Hopkins Highest Level of Mobility.

Table 3. Description of the association between mobility and physical-functional and sociodemographic characteristics of hospitalized patients in oncological treatment in Rio Grande do Sul hospitals, 2024/2025 (n=210)

Variables	Categories	JH-HLM mobility				*p*
		6 to 8 points		1 to 5 points		
		n	%	n	%	
Sex	Male	95	91.3	9	8.7	0.054*
	Female	88	83.0	18	17.0	
Age group	18 to 59 years old	76	92.7	6	7.3	0.041*
	60 years and older	107	83.6	21	16.4	
Education	Up to incomplete high school	123	87.9	17	12.1	0.407*
	Complete high school or higher	60	85.7	10	14.3	
Marital status	Has a spouse	116	91.3	11	8.7	0.022*
	No spouse	67	80.7	16	19.3	
Chemotherapy	No	50	84.7	9	15.3	0.330*
	Yes	133	88.1	18	11.9	
Radiotherapy	No	145	88.4	19	11.6	0.211*
	Yes	38	82.6	8	17.4	
Treatment status	Before treatment	10	90.9	1	9.1	0.926**
	Actively receiving treatment	152	86.9	23	13.1	
	Finished treatment	21	87.5	3	12.5	
Intention of treatment	Healing	154	89	19	11	0.155*
	Palliative	25	75.5	6	19.4	
Former smoker	No	122	87.1	18	12.9	0.593*
	Yes	61	87.1	9	12.9	
IPAQ	Sedentary and irregularly active	142	84.5	26	15.5	0.014*
	Active and very active	41	97.6	1	2.4	
HGS	Normal strength	82	88.2	11	11.8	0.427*
	Muscle weakness	101	86.3	16	13.7	
Continuous medication	No	35	92.1	3	7.9	0.236*
	Yes	148	86	24	14	
BMI	Underweight	42	93.3	3	6.7	0.315**
	Eutrophic	82	83.7	16	16.3	
	Overweight	33	91.7	3	8.3	
	Obesity	26	83.9	5	16.1	
Sarcopenia risk	Low sarcopenia risk	85	95.5	4	4.5	0.001*
	Likely sarcopenia	98	81	23	19	

Captions: JH-HLM = Johns Hopkins Highest Level of Mobility; IPAQ = international physical activity questionnaire; BMI = body mass index; HGS = hand grip strength; PR = prevalence ratio; CI = confidence interval; *Fisher's exact test; **chi-square test.

remained. Patients classified as sedentary or irregularly active presented a higher prevalence (prevalence ratio – PR=1.084; 95% CI: 1.001–1.173) for low mobility in comparison to the physically active patients. Similarly, participants with likely sarcopenia presented a higher prevalence of reduced mobility, while those with low risk presented a lower chance of limited mobility (PR=0.905; 95% CI: 0.824–0.993). The variables sex, age group, and HGS did not present statistically significant associations after the adjustment, although they were considered in the analysis.

DISCUSSION

The results from this study highlighted that most participants had high mobility levels, according to the JH-HLM classification, with a focus on the significant association between younger age, higher level of physical activity before hospitalization, and low sarcopenia risk. The adjusted analysis confirmed the relevance of sedentary lifestyle and sarcopenia risk as independent predictors of the worst mobility level, demonstrating that physically inactive patients with likely sarcopenia presented a higher prevalence of reduced mobility.

Table 4. Description of the crude and adjusted analysis between mobility and physical-functional and sociodemographic characteristics of hospitalized patients in oncological treatment in Rio Grande do Sul hospitals, 2024/2025 (n=210)

Variables	Categories	Crude analysis		Adjusted analysis	
		PR	95% CI	PR	95% CI
Sex	Male	0.920	0.841; 1.006	0.925	0.844; 1.014
	Female	1.0		1.0	
Age group	18 to 59 years old	0.899	0.815; 0.992	0.929	0.848; 1.019
	60 years and older	1.0		1.0	
IPAQ	Sedentary and irregularly active	1.140	1.061; 1.224	1.084	1.001; 1.173
	Active and very active	1.0		1.0	
Sarcopenia risk	Low sarcopenia risk	0.865	0.797; 0.939	0.905	0.824; 0.993
	Likely sarcopenia	1.0		1.0	
HGS	Normal strength	0.902	0.812; 1.001	0.993	0.905; 1.090
	Muscle weakness	1.0		1.0	

Captions: IPAQ = international physical activity questionnaire; HGS = hand grip strength; PR = prevalence ratio; CI = confidence interval.

In the study by Aronson et al.[26], the mobility of hospitalized oncological patients was assessed daily using the Activity Measure for Post-Acute Care (AM-PAC) scale, which quantifies the level of functional mobility based on clinical observations. The primary outcome was the final level of functional mobility, measured by the patient's final position on the scale (above or below the median). Although the authors have not described the initial scores' mean, the results indicate that, with the implementation of an early mobilization program, patients had a significantly higher chance of reaching final scores above the scale median, reflecting better functional performance. Implementing the assessment of mobility in practice contributed to its maintenance or improvement throughout the hospitalization, with a reduction in functional decline and a lower hospital readmission rate. These findings demonstrate that systematic mobility assessment, coupled with early interventions, is effective in monitoring and preserving functionality in patients with cancer during their hospitalization. This reinforces the importance of assessing mobility in oncological patients in the hospital environment; however, the literature still lacks studies associating this measure with other physical assessments and recommending ideal levels for this population.

Another study assessed the mobility of oncological patients at the time of hospital admission and observed that they presented moderate functional limitations, indicating relevant difficulties for performing basic mobility activities. After physiotherapeutic intervention during hospitalization, there was a significant improvement in that outcome, with an average score increase for a slight level of commitment. Factors such as a higher number of physiotherapy sessions, higher initial scores, and absence of bone or spinal metastases were associated with better mobility results at hospital discharge[27]. These findings, in addition to reinforcing the effectiveness of hospital physiotherapy in the functional rehabilitation of cancer patients, encourage the search for other factors that may be associated with mobility level and may be modified before hospitalization, such as improving physical activity levels and muscle mass gain to avoid sarcopenia.

Planchard et al.[3] assessed postoperative mobility of oncological patients using the JH-HLM[28] scales and the Activity Measure for Post-Acute Care (AM-PAC) and verified that this is directly related to patients' previous functional state. Those with better Karnofsky Performance Scale (KPS)[29] scores presented superior performance in postoperative mobility tests. Moreover, higher scores on these mobility scales were also associated with favorable clinical outcomes, such as shorter hospitalization time and a higher probability of being discharged. Such results reinforce that functional recovery after surgical stabilization of the spine in patients with metastases depends not only on the procedure itself but also on previous clinical and functional conditions, which makes these assessments important predictors of mobility and postoperative outcomes.

The relationship between sarcopenia and cancer is well established. The study by Williams et al.[30] analyzed how cancer affects sarcopenia measurements in elderly people, comparing 515 patients with cancer to control patients without the illness. The measurements were obtained annually from densitometry, dynamometry, and walking tests. Before the diagnosis, there was a sharper drop in walking speed. After the diagnosis, there was significant appendicular muscle mass loss, more intense in patients with metastases and advanced age. Hand grip strength did not present relevant alterations. Just like the data found in the present study, sarcopenia risk was found in cancer patients, even when muscle strength, assessed through HGS, did not present alterations. Cancer seems

to accelerate specific functional declines, indicating the importance of early monitoring and intervention.

Another study showed that hand grip strength increased significantly (mean gain of 3.5 kg) after three months of endurance training in women with breast cancer on clinic rehabilitation. This strength was strongly associated with greater functional mobility, higher load lifted, and better metabolic parameters, such as greater muscle mass, lower body fat, wider phase angle, and higher metabolic rest rate. Hand grip strength stood out as a sensitive indicator of muscle and functional condition, suggesting its use as a practical clinical marker in the behavior of breast cancer survivors[31].

Cancer speeds up muscle strength loss, favoring muscle fatigue, cachexia, and sarcopenia, leading to functional decline. In a study that assessed patients with cancer, Norman et al.[32] reported that malnutrition, age, and sex were factors that contributed to peripheral muscle strength reduction, and muscle strength measured with a manual dynamometer was associated with functional state and quality of life. In the present study, hand grip strength, despite the tendency for muscle weakness, was not associated with low mobility. Whereas patients with cancer hospitalized for treatment and assessed in the study by Rocha et al.[33] presented gradual peripheral muscle strength during hospitalization, with gradual mobility improvement in physical function and peripheral muscle strength during rehabilitation, which may suggest that these factors walk side by side in the improvement process and may justify the findings from the present study with no association, since the mobility level of the studied sample was considered high in the assessments.

The incidence of neoplasms in Brazil sharply increased over the last few years. The increase is partially attributed to population aging, which directly influences cancer incidence, given that somatic mutations from exposure to endogenous and exogenous agents are determinant factors in the carcinogenesis process. Furthermore, lifestyle factors such as sedentary life, alcohol and tobacco intake increase the risk of developing cancer[33]. The data found by other researchers corroborate the findings from this study: most patients with cancer are older and sedentary, with these two factors being associated with a lower mobility level during hospitalization.

In a systematic review that investigated the impact of sedentary behavior, like time sitting down or physical inactivity, on health outcomes of cancer survivors, Swain et al.[34] suggested that higher levels of sedentary lifestyle after diagnosis are associated with worse quality of life, higher fatigue, higher risk of depression, lower physical function, and higher mortality. The review, which included 27 studies with more than 45 thousand participants, suggests that interventions to reduce sedentary time are clinically relevant to this population. Although the authors have not found studies that directly assessed the mobility of these patients, the other physical-functional conditions point to a lower level of mobility, just like in the findings from the present study, and further reinforce the importance of this simple-to-implement variable in the daily practice of health professionals.

It is important to highlight that this study presents some limitations. The assessed sample was exclusively composed of patients with a cancer diagnosis in hospital treatment; therefore, these results must be treated with caution when extrapolating to other populations. The mobility assessment was conducted at a single moment, which could be biased by the patient's health status during that short window of time. Additionally, it was not possible to monitor the patients after hospital discharge to investigate the possible factors that influence muscle strength and physical function in the sample. The impossibility of establishing a causal relationship, since the study has a cross-sectional design, also stands out. However, we highlight the rigorous data collection process, conducted by physiotherapists trained for this function.

These findings indicate that mobility levels in people with cancer are associated with clinical and behavioral factors, especially the practice of physical activity and muscle mass integrity. The relationship between an active lifestyle and mobility preservation reinforces the importance of interventions targeted at promoting functionality and exercises to increase muscle mass, while the identification of sarcopenia risk can be a strategy in the prevention of functional dependence, mainly in vulnerable oncological populations.

We expect the data obtained to deepen understanding of the relationship between mobility and physical-function condition, contributing to the development of customized, easy-to-apply rehabilitation strategies, in addition to guiding more effective and encompassing healthcare both during hospitalization and in care recommendations in health promotion and prevention of non-degenerative chronic illnesses.

CONCLUSION

The results of this study reinforce the importance of clinical and behavioral factors in determining mobility levels in hospitalized oncological patients. The association between higher mobility, lower sarcopenia risk, and previous physical activity practice highlights the protective role of an active lifestyle and muscle mass preservation in the face of functional decline. Furthermore, identifying

sedentary patients with sarcopenia risk as the most susceptible to reduced mobility underscores the need for early screening strategies and targeted interventions during hospitalization.

Findings from previous strategies corroborate these results, demonstrating that cancer can accelerate specific functional losses, even in the absence of evident alterations in muscle strength, and that interventions like endurance training can significantly improve functional and metabolic parameters after hospital discharge. Thus, mobility assessment and muscle integrity must be incorporated into the clinical routine as a tool to guide rehabilitation conduct and functional follow-up. Despite limitations related to the cross-sectional design and specificity of the sample, this study contributes to understanding interactions between mobility, sarcopenia, and lifestyle, and suggests pathways to promote functionality and independence in hospitalized oncological populations.

CONTRIBUTIONS

All the authors have substantially contributed to the study design and planning, acquisition, analysis, interpretation of the data, wording, and critical review. They approved the final version for publication.

DECLARATION OF CONFLICT OF INTERESTS

There is no conflict of interest to declare.

DATA AVAILABILITY STATEMENT

All the contents associated with the article are included in the manuscript.

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Scientific-editor: Anke Bergmann. Orcid iD: https://orcid.org/0000-0002-1972-8777