




Factors associated with functional disability in older adults with cancer treated at reference outpatient clinics in the state of Mato Grosso, Brazil

Fatores associados à incapacidade funcional em idosos com câncer atendidos em ambulatórios de referência no estado de Mato Grosso, Brasil

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ABSTRACT: *Objective:* To analyze factors associated with functional disability in older adults with cancer treated at reference outpatient clinics in the state of Mato Grosso, Brazil. *Methods:* This is a cross-sectional study of 463 older adults aged 60 years or older. The outcome variable was functional disability, evaluated by Lawton and Brody's Instrumental Activities of Daily Living (IADL) scale. The independent variables were sociodemographic characteristics, lifestyle, social support, and health aspects. We performed bivariate and multivariate analyses and calculated prevalence ratios (PR) using Poisson regression with robust variance. *Results:* The prevalence of IADL functional disability was 55.3%. The variables associated with this disability in the multivariate analysis were: not working (PR=1.36; 95% confidence interval — 95%CI 1.03–1.78); low (PR=1.49; 95%CI 1.10–2.03) and moderate (PR=1.30; 95%CI 1.04–1.64) perceived affectionate support; depressive symptoms (PR=1.31; 95%CI 1.10–1.56); malnutrition (PR=1.28; 95%CI 1.03–1.59); having two or more comorbidities (PR=1.30; 95%CI 1.03–1.64), and having a companion to health services (PR=1.39; 95%CI 1.05–1.83). *Conclusion:* In addition to physical health aspects, comorbidities, and malnutrition, functional disability was associated with emotional, social support, and work issues, reinforcing the importance of comprehensive care and actions to maintain and recover functional capacity, promoting a better quality of life, the independence of older adults with cancer, and a reduced risk of adverse biopsychosocial outcomes.

Keywords: Aged. Functional status. Neoplasms. Medical oncology. Ambulatory care facilities. Epidemiology.

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Conflict of interests: nothing to declare – **Financial support:** Project funded by the 23rd Region MPT, through the Technical Cooperation Agreement No. 08/2019.

Associated editors: Elisete Duarte , Gulnar Azevedo e Silva 

Scientific editor: Cassia Maria Buchalla 

This document has an erratum: <https://doi.org/10.1590/1980-549720220019.supl.1erratum>

RESUMO: *Objetivo:* Analisar os fatores associados à incapacidade funcional em idosos com câncer atendidos em ambulatórios de referência do estado de Mato Grosso, Brasil. *Métodos:* Estudo transversal, com 463 idosos de 60 anos ou mais. A variável desfecho foi a incapacidade funcional, avaliada por meio da Escala de Atividades Instrumentais de Vida Diária (AIVD) desenvolvida por Lawton e Brody. As variáveis independentes foram características sociodemográficas, estilo de vida, apoio social e condições de saúde. Foram realizadas análises bivariada e múltipla, calculando-se as razões de prevalência (RP), com o uso de regressão de Poisson com variância robusta. *Resultados:* A prevalência de incapacidade funcional para as AIVD foi de 55,3%. As variáveis que se associaram a essa incapacidade na análise múltipla foram: não trabalhar (RP=1,36, intervalo de confiança — IC95% 1,03–1,78); percepção de apoio afetivo baixo (RP=1,49; IC95% 1,10–2,03) e médio (RP=1,30; IC95% 1,04–1,64); sintomas depressivos (RP=1,31; IC95% 1,10–1,56); desnutrição (RP=1,28; IC95% 1,03–1,59); ter duas ou mais comorbidades (RP=1,30; IC95% 1,03–1,64) e ter acompanhante aos serviços de saúde (RP=1,39; IC95% 1,05–1,83). *Conclusão:* Além das condições de saúde física, comorbidade e desnutrição, as questões emocionais, de apoio social e trabalho associaram-se à incapacidade funcional, reforçando a importância de uma atenção integral e de ações de manutenção e recuperação da capacidade funcional, promovendo maior qualidade de vida, a independência do idoso com câncer e a redução do risco de desfechos adversos em âmbito biopsicossocial.

Palavras-chave: Idoso. Estado funcional. Neoplasias. Oncologia. Instituições de assistência ambulatorial. Epidemiologia.

INTRODUCTION

Cancer is one of the main causes of death in the world and has contributed to changing the pattern of life expectancy increase in all countries. Cancer incidence and mortality have grown rapidly¹. In 2020, approximately 19.3 million people worldwide had cancer, and this number is expected to reach 28.4 million by 2040².

Around 70.0% of cancer cases globally affect people after the age of 65¹. In 2020, 12.3 million new cancer cases were estimated in older adults aged 60 years or more³. In Brazil, cancer prevalence is up to four times higher in older adults than in adults⁴, and estimates indicated 592 thousand new cancer cases in 2020, of which more than 62.0% affected older adults³.

The cancer scenario, which includes diagnosis, progression, recurrence, and treatment, is a determinant of functional decline⁵, which, in turn, is a predictor of lower survival. It can also contribute to some adverse results, such as morbidity, mortality, hospitalizations, and chemotoxicity⁵ — in addition to the negative effects on physical health, older adults also face the psychosocial and financial costs of cancer⁶.

The disease causes physical and emotional stress, regardless of age; however, compared to young patients, older adults have more pre-existing chronic diseases, impaired physical and cognitive function, and decreased physiological reserve⁷; additionally, individuals with cancer have a greater chance of presenting functional disability⁸. The concept of functional disability has a multidimensional nature, and based on this approach, the World Health Organization (WHO), in its International Classification of Functioning, Disability and Health (ICF), defined functioning and disability as outcomes of a complex and dynamic interaction

between health conditions (diseases, disorders, injuries, among others) and contextual factors: environmental and personal⁹.

Functional disability in older adults usually corresponds to difficulty in basic self-care tasks, including instrumental activities of daily living (IADL), which leads to autonomy restrictions and dependence, reducing their quality of life and increasing the use of health services^{10,11}. Epidemiological studies often use the Lawton and Brody scale for its measurement¹².

A meta-analysis showed that the prevalence of IADL functional disability in older adults with cancer from the overall world population was 54.0%¹². Among the 43 works selected for the study, only one was carried out in Brazil, demonstrating that research related to the subject is still scarce in the country. In a national population-based survey, 33.0% of older adults reported that cancer or some problem caused by it restricted their usual activities¹³.

Cross-sectional studies indicate a relationship between the variables: socioeconomic status¹⁴, sedentary lifestyle¹⁵, malnutrition¹⁶, comorbidities¹⁷, depression¹⁸, social support¹⁹, and functional disability in older adults with cancer. Longitudinal investigations show the importance of evaluating baseline functional impairment, polypharmacy, depression, abnormal nutritional status, cognitive impairment, comorbidities, and higher symptom burden, as they are predictors of functional decline in older adults with cancer^{5,8,20-22}.

Considering that disability is a multidimensional concept and the scarcity of regional research, the present study aimed to analyze sociodemographic, lifestyle, health, and social support factors associated with functional disability in older adults with cancer treated at reference outpatient clinics in the state of Mato Grosso.

METHODS

This cross-sectional study is part of the research “Cancer and its associated factors: analysis of the population- and hospital-based registry from Cuiabá-MT”, developed by the Institute of Collective Health from Universidade Federal de Mato Grosso (UFMT) in partnership with the Ministry of Public Labor Prosecution and the State Health Department. Interviews were conducted from November 2019 to March 2020, and data were collected from medical records between December 2019 and June 2021, with suspension between March 2020 to April 2021 due to the COVID-19 pandemic. The hospitals selected for the study were: Hospital Universitário Júlio Muller (HJUM) — UFMT’s teaching hospital — and Hospital de Câncer de Mato Grosso (HCan), as well as a Tertiary Care Cancer Center (*Unidade de Assistência de Alta Complexidade em Oncologia* — UNACON), responsible for about 70% of the total cancer care in the state²³.

The estimated population of Mato Grosso in 2021 was 3,567,234 inhabitants, and according to the last census, almost 8% of the population corresponded to older adults. The state has 141 municipalities heterogeneously distributed — only five of them have a population greater than 100 thousand inhabitants —, and the largest population concentration is in the capital Cuiabá, with 623,614 inhabitants^{24,25}.

The sample of the original research was calculated considering the number of cancer-related hospitalizations — obtained from the Cancer Hospital Registry (2015) — of patients aged 20 years or older treated at two hospitals in Mato Grosso, with a maximum proportion of $p=0.50$, 2.5% error tolerance, and 95% confidence level. The estimated sample was 1,050 patients, considering a 10% loss. The inclusion criteria for participant selection were: individuals aged 18 years or older, receiving cancer treatment, treated at the HCan and HJUM outpatient clinics during data collection, who agreed to participate in the study and signed the Informed Consent Form. A total of 1,122 patients were invited to participate in the study, six of whom refused, totaling 1,116. During the collection of information from medical records, 21 interviewees did not have their medical records located, and 83 did not have a confirmed cancer diagnosis. Thus, the final sample comprised 1,012 patients.

The present study selected from the total sample older adults aged 60 years or older receiving outpatient care, with a cancer diagnosis confirmed by medical records, regardless of staging and type of treatment, totaling 463 participants. Since the sample of the original study was not restricted to older adults, the sample power to investigate factors associated with functional disability was calculated *a posteriori*. Thus, with the sample size defined as 463 older adults, a ratio between exposed and non-exposed of 1.4, prevalence of 0.65 and 0.48 for exposed and non-exposed, respectively, and alpha of 0.05, the power was 95.7%.

Data were collected through face-to-face interviews conducted at the outpatient clinics by trained interviewers who used an electronic data collection device (Open Data Kit — ODK)²⁶. Older adults who had visits scheduled were invited to participate in the study, and only the patients could answer the questions. The data collection questionnaire had questions about the main risk factors for cancer, chronic diseases, and disability, as well as validated questions used in population-based surveys^{27,28}.

The outcome variable was functional disability, assessed by the Lawton and Brody²⁹ scale and validated for use in Brazil³⁰; this scale evaluates the individual's performance in eight activities that are more elaborated and involve cognitive functions: ability to use telephone, shopping, housekeeping, food preparation, doing manual household chores, using a mode of transportation, responsibility for own medications, and ability to handle finances. Each question has three possible answers, producing the following score: 1 point (dependent), 2 points (partly dependent), and 3 points (independent). The final score corresponds to the sum of the points of each domain, ranging from 8 to 24 points. Disability was defined as the need for partial or total aid in at least one activity (score ≤ 23 points)²⁹.

The independent variables were sociodemographic characteristics, lifestyle, social support, religiosity, and health aspects. Sociodemographic variables were gender, age group, marital status, ethnicity/skin color, schooling, economic status according to the Brazilian Economic Classification Criteria³¹, current working situation, and municipality of residence.

The lifestyle, religiosity, and social support variables included alcohol consumption, smoker and/or former smoker, passive smoker at home, leisure-time physical activity, excessive screen time, and using the mobile phone for more than 3 h/day. Organizational and non-organizational religiosity. Social support: tangible support, informational/emotional

support, affectionate support, and positive social interaction. Each dimension was categorized according to low, moderate, and high scores.

We included the following variables related to health aspects: family history of cancer, staging, self-rated health, having health insurance, depressive symptoms, having a companion to health services, and body mass index (BMI) obtained from self-reported weight and height during the interview and classified according to the Ministry of Health's recommendation for older adults³² (self-reported weight and height measurements can be used as valid alternatives to estimate the weight status in the Brazilian older population)^{28,33}. Comorbidities were assessed by the question "Has any physician ever diagnosed you with: hypertension, diabetes, kidney disease, endocrine disease, respiratory disease, or another disease (if yes, which one or ones)?" and classified as: two or more, one, or no comorbidities. The following clinical variables were also included: cancer type, according to the International Classification of Diseases — ICD-10 (C00-C97; D46), staging, metastasis, and type of treatment, obtained from medical records.

To analyze the practice of leisure-time physical activity, we considered some answers regarding the type of activity performed by the older adult, as well as the frequency and duration of the practice: individuals were considered active during leisure time when they practiced more than 150 minutes of moderate physical activity or 75 minutes of vigorous activities weekly or a combination of the two, totaling 150 minutes, following WHO recommendations¹⁵. We multiplied the duration by the weekly frequency of activities considered moderate and vigorous^{15,27,28}.

The following questions were used to evaluate current and past smoking: "Do you currently smoke any tobacco product?" And "In the past, have you smoked any tobacco product on a daily basis?". To investigate passive smoking: "Does anyone who lives with you smoke inside the house?". Regular alcohol consumption was defined as drinking alcoholic beverages in the previous 30 days, regardless of the amount consumed²⁷.

Sedentary behavior was evaluated by the questions: "On average, how many hours of your free time do you spend watching TV or using the computer, tablet, or mobile phone per day?"²⁸. Excessive screen time was defined as three or more hours of free time spent on these activities per day.

Questions about religiosity are part of the Portuguese version of the Duke University Religion Index (P-DUREL), from which we used the first two items³⁴. Questions related to depressive symptoms are part of the Patient Health Questionnaire-9 (PHQ-9), which proved to be appropriate for the screening of major depressive episodes in the Brazilian population. We adopted a cut-off point ≥ 9 , as recommended³⁵.

Social support questions are part of the Social Support Survey (MOS-SSS) validated for Portuguese³⁶, which uses a Likert scale: 0 (none of the time); 1 (a little of the time); 2 (some of the time); 3 (most of the time), and 4 (all of the time). The classification used the cut-off points proposed by Zanini et al.³⁷ to evaluate the dimensions: tangible support, emotional/informational support, affectionate support, and positive social interaction. The higher the score, the greater the perceived support received in each dimension³⁷.

The descriptive data analysis used absolute and relative frequencies for categorical variables and mean and standard deviations (SD) for numerical variables. In the bivariate and multivariate analysis, we calculated prevalence ratios (PR) and their respective 95% confidence intervals (95%CI) to measure the association between the dependent — IADL functional disability — and independent variables, using Poisson regression with robust variance. The multivariate analysis included all variables with $p < 0.20$ in the bivariate analysis. We adopted the backward method, that is, we progressively removed from the model the variables that did not present $p < 0.05$, except for gender and age group, which were retained in the model as adjustments. The adequacy of the model was verified by the goodness of fit test. All analyses were performed in the Stata® software, version 16.1.

The study was approved by the Research Ethics Committee (REC) of HUFM, under opinion No. 3,048,183, and the REC of SES/MT, under opinion No. 3,263,744.

RESULTS

In the present study, most older adults with cancer were aged 60 to 69 years (56.4%), the mean age was 69.4 years (SD=7), 61.8% were male, 54.2% lived with a partner, 72.1% had up to eight years of schooling, and 80.8% earned from one to less than three times the minimum wage. The most frequent types of cancer were: prostate (36.7%), breast (17.7%), colorectal (7.1%), lung (3.9%), and skin (2.6%) cancer. Among the participants, 31.6% self-reported two or more comorbidities, of which the most common were hypertension (60.0%), diabetes (17.3%), chronic kidney disease (10.6%), and chronic lung disease (7.6%).

Regarding cancer staging, 29.8% were classified as 0, I, and II; 46.2% as III and IV; and 24.0% did not have this information. Those receiving curative cancer treatment totaled 79.3%, while 20.7% received palliative treatment. As for distant metastasis, 49.5% did not present metastasis (M0), 19.2% presented metastasis (M1), 4.3% were cases in which assessing distant metastasis was impossible (MX), and 27.0% of the medical records did not have such information.

The prevalence of IADL disability was 55.3% (95%CI 50.7–59.9), and older adults showed greater disability in the following activities: housekeeping (41.3%), shopping (25.9%), and using a mode of transportation (22.9%).

In the bivariate analysis, the sociodemographic variables associated with IADL disability were the age group 70 years and older, up to eight years of schooling, and not working currently (Table 1). No lifestyle variable was associated with IADL disability in the bivariate analysis (Table 2).

The social support variables associated with IADL disability were: moderate perceived informational and emotional support and moderate perceived positive social interaction (Table 3).

Table 1. Prevalence of functional disability in instrumental activities of daily living according to sociodemographic variables in older adults with cancer treated at outpatient clinics, Mato Grosso, 2020.

Variables	Total	Functional disability (IADL)			
	n (%)	Prevalence	PR	95%CI	p-value
		n (%)			
Gender*					
Female	177 (38.2)	104 (59.8)	1.14	0.96–1.34	0.130
Male	286 (61.8)	150 (52.6)	1.00		
Age group*					
70 and older	202 (43.6)	130 (65.0)	1.36	1.15–1.60	0.001 [‡]
60 to 69 years	261 (56.4)	124 (47.9)	1.00		
Marital status*					
Without partner	212 (45.8)	123 (58.6)	1.11	0.95–1.31	0.200
With partner	251 (54.2)	131 (52.6)	1.00		
Ethnicity/skin color[†]					
Multiracial/Black	288 (64.0)	153 (53.3)	0.90	0.76–1.07	0.230
White/Asian/Indigenous	162 (36.0)	94 (59.1)	1.00		
Schooling*					
Up to 8 years	333 (72.1)	198 (59.8)	1.38	1.11–1.72	0.004 [‡]
9 and over	129 (27.9)	55 (43.3)	1.00		
ABEP classification*					
Classes C1, C2, D-E	388 (83.8)	216 (56.3)	1.11	0.87–1.41	0.394
Classes A, B1, B2	75 (16.2)	38 (50.7)	1.00		
Currently working*					
No	372 (80.5)	216 (58.5)	1.39	1.07–1.80	0.013 [‡]
Yes	90 (19.5)	38 (42.2)	1.00		
Municipality of residence*					
Inland	282 (61.3)	159 (56.4)	1.05	0.89–1.25	0.573
Cuiabá and Várzea Grande	179 (38.7)	95 (53.7)	1.00		

IADL: instrumental activities of daily living; PR: prevalence ratio; 95%CI: 95% confidence interval; ABEP: Associação Brasileira de Empresas de Pesquisa (Brazilian Association of Research Companies); *up to 5 respondents; [†]17 respondents; [‡]p≤0.05, statistically significant.

The variables related to health aspects associated with IADL disability were: not having health insurance, having two or more chronic comorbidities, depressive symptoms, malnutrition, and having a companion to health services. Staging showed no significant association with functional disability (III, IV: $p=0.841$; no information: $p=0.422$) (Table 4).

The variables that remained associated with IADL functional disability in the multivariate analysis were: not working currently (PR=1.36; 95%CI 1.03–1.78); low (PR=1.49; 95%CI 1.10–2.03) and moderate (PR=1.30; 95%CI 1.04–1.64) perceived affectionate support; depressive symptoms (PR=1.31; 95%CI 1.10–1.56); malnutrition (PR=1.28; 95%CI 1.03–1.59); having two or more comorbidities (PR=1.30; 95%CI 1.03–1.64), and having a companion to health services (PR=1.39; 95%CI 1.05–1.83) (Table 5).

Table 2. Prevalence of functional disability in instrumental activities of daily living according to lifestyle variables in older adults with cancer treated at outpatient clinics, Mato Grosso, 2020.

Variables	Total	Functional disability (IADL)			
	n (%)	Prevalence	PR	95%CI	p-value
		n (%)			
Regular alcohol consumption*					
Yes	61 (13.2)	26 (42.6)	0.75	0.55–1.01	0.058
No	401 (86.8)	227 (57.2)	1.00		
Smokes and/or smoked tobacco products*					
Yes	269 (58.1)	152 (53.1)	1.07	0.90–1.27	0.423
No	194 (41.9)	102 (56.9)	1.00		
Passive smoker — home*					
Yes	53 (11.5)	35 (66.0)	1.22	0.98–1.51	0.063
No	410 (88.5)	219 (53.9)	1.00		
Leisure-time physical activity*					
Inactive	392 (84.5)	219 (56.6)	1.18	0.67–1.11	0.240
Active	72 (15.5)	35 (48.6)	1.00		
Excessive screen time (TV, tablet, computer, mobile phone)*					
Yes	229 (49.5)	121 (53.1)	0.92	0.78–1.09	0.333
No	234 (50.5)	133 (57.7)	1.00		
Connected to the mobile phone for more than 3 h/day*					
Yes	48 (10.4)	21 (44.7)	0.79	0.57–1.10	0.161
No	415 (89.6)	233 (56.6)	1.00		

IADL: instrumental activities of daily living; PR: prevalence ratio; 95%CI: 95% confidence interval; *up to 5 respondents.

DISCUSSION

This study showed a high prevalence of IADL functional disability in older adults with cancer treated at outpatient clinics; functional disability was associated with depressive

Table 3. Prevalence of functional disability in instrumental activities of daily living according to religiosity and social support variables in older adults with cancer treated at outpatient clinics, Mato Grosso, 2020.

Variables	Total	Functional disability (IADL)			
	n (%)	Prevalence	PR	95%CI	p-value
		n (%)			
Organizational religiosity*					
Rarely/never	128 (27.9)	77 (60.6)	1.14	0.96–1.35	0.148
Often	331 (72.1)	175 (53.4)	1.00		
Non-organizational religiosity*					
Rarely/never	66 (14.3)	33 (50.0)	0.90	0.69–1.15	0.370
Often	397 (85.7)	221 (56.2)	1.00		
Tangible support†					
Low	18 (3.9)	7 (38.9)	0.69	0.39–1.25	0.227
Moderate	48 (10.6)	29 (60.4)	1.08	0.85–1.38	0.530
High	389 (85.5)	215 (55.8)	1.00		
Informational and emotional support†					
Low	25 (5.6)	13 (52.0)	0.99	0.67–1.46	0.953
Moderate	114 (25.5)	71 (62.8)	1.19	1.01–1.43	0.050 [‡]
High	309 (68.9)	161 (52.6)	1.00		
Affectionate support†					
Low	23 (5.0)	15 (65.2)	1.23	0.90–1.68	0.204
Moderate	45 (9.9)	30 (66.7)	1.25	0.99–1.57	0.052
High	389 (85.1)	205 (53.3)	1.00		
Positive social interaction†					
Low	41 (9.1)	20 (48.8)	0.91	0.65–1.26	0.565
Moderate	71 (15.7)	47 (66.2)	1.23	1.01–1.50	0.035 [‡]
High	339 (75.2)	180 (53.7)	1.00		

IADL: instrumental activities of daily living; PR: prevalence ratio; 95%CI: 95% confidence interval; *4 to 8; †10 to 19 respondents; ‡p≤0.05, statistically significant.

Table 4. Prevalence of functional disability in instrumental activities of daily living according to health aspects in older adults with cancer treated at outpatient clinics, Mato Grosso, 2020.

Variables	Total	Functional disability (IADL)			
	n (%)	Prevalence	PR	95%CI	p-value
		n (%)			
Family history of cancer*					
Yes	192 (42.0)	104 (54.7)	1.02	0.86–1.21	0.808
No	265 (58.0)	147 (55.9)	1.00		
Staging*					
III and IV	214 (46.2)	116 (54.7)	1.02	0.84–1.24	0.841
No information	111 (24.0)	64 (58.7)	1.09	0.87–1.37	0.422
0, I, and II	138 (29.8)	74 (53.6)	1.00		
Self-rated health†					
Regular, poor, and very poor	243 (52.9)	141 (58.5)	1.13	0.96–1.35	0.132
Good and very good	216 (47.1)	110 (51.4)	1.00		
Health insurance*					
No	287 (62.0)	171 (60.2)	1.27	1.05–1.53	0.010‡
Yes	176 (38.0)	83 (47.4)	1.00		
Comorbidities*					
2 or more	146 (31.5)	90 (61.6)	1.31	1.50–1.64	0.016‡
1	180 (38.9)	101 (56.4)	1.20	0.96–1.50	0.106
0	137 (29.6)	63 (47.0)	1.00		
Depressive symptoms†					
Yes (score ≥9)	104 (23.2)	76 (73.8)	1.50	1.28–1.76	<0.001‡
No (score 0 to 8)	345 (76.8)	168 (49.1)	1.00		
BMI‡					
<22 (malnutrition)	67 (15.9)	47 (71.2)	1.38	1.11–1.71	0.004‡
>27 (obesity)	204 (48.3)	105 (51.5)	0.99	0.81–1.22	0.969
≥22 to ≤27 (normal weight)	151 (35.8)	77 (51.7)	1.00		
Having a companion to health services†					
Yes	367 (79.4)	218 (60.1)	1.58	1.21–2.08	0.001‡
No	95 (20.6)	36 (37.9)	1.00		

IADL: instrumental activities of daily living; PR: prevalence ratio; BMI: body mass index; *4; †8 to 18; ‡44 respondents; †p<0.05, statistically significant.

Table 5. Multivariate regression between functional disability and sociodemographic variables, social support, and health aspects in older adults with cancer treated at reference outpatient clinics in Mato Grosso, 2020.

Variables	Adjusted PR	95%CI	p-value
Gender			
Male	1.00	0.86–1.22	0.757
Female	1.03		
Age group			
60 to 69 years	1.00	0.97–1.37	0.114
70 years or older	1.15		
Currently working			
Yes	1.00	1.03–1.78	0.028*
No	1.36		
Affectionate support			
High	1.00		
Moderate	1.30	1.04–1.64	0.020*
Low	1.49	1.10–2.03	0.010*
Depressive symptoms			
No	1.00	1.10–1.56	0.003*
Yes	1.31		
Nutritional status			
≥22 to ≤27 (normal weight)	1.00		
>27 (obesity)	1.01	0.81–1.23	0.996
<22 (malnutrition)	1.28	1.03–1.59	0.027*
Comorbidities			
0	1.00		
1	1.20	0.96–1.52	0.110
2 or more	1.30	1.03–1.64	0.027*
Having a companion to health services			
No	1.00	1.05–1.83	0.020*
Yes	1.39		

PR: prevalence ratio; 95%CI: 95% confidence interval; *p≤0.05, statistically significant.

symptoms, affectionate support, work, comorbidities, malnutrition, and having a companion to health services.

In a meta-analysis, the mean disability prevalence in Brazilian older adults was 42.8% among women and 39.6% among men. Prevalence rates ranged from 12.3 to 94.1% in men and 14.9 to 84.6% in women³⁸, which may be explained by the different types of study and data collection contexts. Another meta-analysis of worldwide studies identified a prevalence of IADL disability in older adults with cancer between 13.0 and 75.0% in outpatient settings¹².

In a study of Brazilian older adults with multimorbidities, the prevalence of IADL disability was much lower (29.1%)³⁹. A population-based study of older adults from a community identified a prevalence of 34.0%, even with 89.3% of them presenting some type of comorbidity⁴⁰.

The activities that older adults reported having a greater disability were: housekeeping, shopping, and using a mode of transportation. These findings corroborate studies with similar results^{12,40}, which demonstrated that older adults presented IADL disability in essential activities to their well-being, autonomy, and even freedom of movement.

We found an association between depressive symptoms and greater functional disability in older adults with cancer. Other works highlight this association, which may have negative and even irreversible consequences^{11,41}. A comparative study of older adults with and without cancer that also used PHQ-9 found a higher prevalence of depression in those with cancer⁴². The literature reports a group of associated factors, including depression and isolation, that indicate a higher risk of suicide in older adults with cancer⁴³.

Low and moderate perceived affectionate support was associated with IADL functional disability. Similar to our finding, a Mexican study assessing older adults from a community revealed that those dissatisfied with the social support received were more likely to have IADL limitations⁴⁴. Population-based research in Brazil revealed that older adults who do not live with a partner, do not participate in social activities, and do not have voluntary/paid work are more likely to have IADL disability⁴⁵. For older adult cancer survivors in the United States, adding new relationships to their social network had a protective effect against functional impairment; in turn, the reduced frequency of contact with people from the social network was associated with functional deficit¹⁹.

Malnutrition was also associated with IADL functional disability in the present study. This health condition may worsen the prognosis and lead not only to functional decline but also to other complications in older patients with cancer, such as low overall survival, worse quality of life, longer length of stay, and hospital readmission, among others^{16,22}.

Comorbidity was also associated with functional decline (comorbidity is the coexistence of disorders in addition to a primary disease of interest)¹⁷; the most frequent ones in the present investigation were hypertension and diabetes. These diseases were also more common in a population-based study of Brazilian older adults, followed by arthritis, heart disease, depression, stroke, and lung disease. The study also emphasized that the diseases that contributed the most to IADL dependence were arthritis and stroke⁴⁶. However, in the present study, the prevalence of musculoskeletal diseases, such as arthritis (1.5%, data not

shown), and stroke (0.4%, data not shown) was low; yet, this result may be related to the measurement method since these morbidities were evaluated in the “other diseases” option and not as separate questions.

In the cancer scenario, comorbidity is associated with the presence, nature, and severity of health conditions that coexist with the disease, and its impact should be assessed at both treatment and survival levels¹⁷. Studies confirm the relation of the presence and burden of comorbidities with increased functional deficits, as well as worse survival in older adults with cancer^{7,47,48}.

The lack of work at the time of data collection was associated with disability, a result that corroborates other studies in which older adults without a professional activity presented a decrease in IADL functional capacity^{40,45} and even a worsening in physical performance⁴⁹. Another possible explanation is reverse causality, that is, the fact that the older adult has cancer can lead to functional disability and the consequent loss or suspension of work activities.

Having a companion to health services was associated with disability, an expected result since dependent patients often have reduced mobility and difficulty using modes of transportation alone, relying on the assistance of their companion to travel^{40,50}.

Some study limitations should be mentioned, such as the impossibility of using clinical cancer information in the association analysis due to the high frequency of missing data and the lack of evaluation of the cognitive status, which may be associated with depression and disability⁴¹. In addition, the study was not designed to specifically assess the older population, so we used a subsample of the original study. Also, the cross-sectional design does not allow us to establish temporality between exposure and outcome. Lastly, survival bias should be taken into account, as older adults who are more dependent, have more severe types of cancer, and even those with more advanced age could have died or been hospitalized, thus underestimating the prevalence investigated. Among our strengths, we can mention that this study analyzed original primary data from Mato Grosso, using instruments validated for the Brazilian population, in addition to being carried out in reference outpatient clinics for cancer treatment.

The results reinforce the importance of comprehensive health care for older adults. In addition to physical health aspects, psychosocial factors are also important and should be considered in such a complex condition as cancer. Functional capacity should be evaluated before, during, and after treatment, providing means to maintain and recover the functional capacity of older adults, and thus reducing adverse biopsychosocial outcomes.

ACKNOWLEDGMENTS

We thank SES-MT for the partnership in the elaboration of instruments and the contact with cancer services; the 23rd Region Ministry of Public Labor Prosecution for funding the research; and HJMJ and HCan for providing an appropriate space for patients during data collection.

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Received on: 08/16/2021

Reviewed on: 03/30/2022

Accepted on: 04/01/2022

Preprint: 04/19/2022

<https://preprints.scielo.org/index.php/scielo/preprint/view/3952>

Corrected on: 09/13/2024

Authors' contributions: Cabral, J.F.: formal analysis, conceptualization, data curation, writing – original draft, writing – review & editing, investigation, methodology, visualization, validation. Galvão, N.D.: project administration, conceptualization, data curation, writing – review & editing, funding acquisition. Andrade, A.C.S.: formal analysis, conceptualization, data curation, writing – review & editing. Silva, A.M.C.: formal analysis, conceptualization, data curation, writing – review & editing, supervision.

