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ORIGINAL ARTICLE

Health impacts on cancer patients: an overview of the COVID-19 pandemic in Brazil

Impactos na saúde do paciente oncológico: um panorama da pandemia por COVID-19 no Brasil

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Abstract

Introduction: Because of the social isolation during the COVID-19 pandemic, the use of health services and the participation in social activities of cancer patients

have been reduced, which can have a direct impact on their health. *Objective*: To identify the repercussions on the cancer treatment, participation in social activities and emotional state of cancer patients in Brazil during COVID-19 pandemic. *Methods*: This is a cross-sectional study using an online questionnaire for cancer patients. A non-probability sample was recruited by convenience. Sociodemographic and clinical data, physical activity levels and emotional state (DASS-21) during the pandemic were collected. Quantitative data were analyzed and the significance level set at 95% ($p < 0.05$). *Results*: A total of 105 individuals participated in the study. Results indicated that younger participants were more stressed; 16.2% reported interrupting cancer treatment and 42.9% cancelled examinations or appointments during the pandemic, associated with a higher rate of stress, anxiety, and depression. More than half of the individuals engaged in exercise before the pandemic, but only 35.2% did so in the previous 2 months. Physical exercise during the pandemic was associated with lower depression score. *Conclusion*: As observed worldwide, the COVID-19 pandemic has had a direct impact on the physical and mental health of cancer patients in Brazil.
Keywords: COVID-19; cancer; anxiety; depression; stress.

Resumo

Introdução: Como consequência do isolamento social durante a pandemia de COVID-19, reduziu-se a utilização de serviços de saúde e a participação em atividades sociais de pacientes com câncer, o que pode impactar diretamente em sua saúde. *Objetivo*: Identificar as repercussões no tratamento do câncer, na participação em atividades sociais e no estado emocional de pacientes com câncer no Brasil durante a pandemia de COVID-19. *Métodos*: Trata-se de um estudo transversal com questionário online para pacientes com câncer. Uma amostra não probabilística foi recrutada por conveniência. Dados sociodemográficos e clínicos, níveis de atividade física e estado emocional (DASS-21) durante a pandemia foram coletados. Os dados quantitativos foram analisados e o nível de significância estabelecido em 95% ($p <0,05$). *Resultados*: Participaram do estudo 105 indivíduos. Os resultados indicaram que os participantes mais jovens estavam mais estressados; 16,2% relataram interrupção do tratamento contra o câncer e 42,9% cancelaram exames ou consultas durante a pandemia, associado a maior índice de estresse, ansiedade

e depressão. Mais da metade dos indivíduos praticou exercícios antes da pandemia, mas apenas 35,2% o fizeram nos 2 meses anteriores. O exercício físico durante a pandemia foi associado a menor escore de depressão. *Conclusão*: Conforme observado em todo o mundo, a pandemia de COVID-19 teve impacto direto na saúde física e mental de pacientes com câncer no Brasil.
Palavras-chave: COVID-19; câncer; ansiedade, depressão, estresse.

Introduction

The epidemic caused by the new coronavirus originated in Wuhan, China at the end of 2019 and assumed catastrophic proportions worldwide. The growing rates of contamination and deaths led the World Health Organization to consider it a pandemic in March 2020. After being infected, individuals may manifest mild or severe symptoms, with systemic damage affecting different organs depending on the individual reaction of the immunological system [1].

The presence of comorbidities, such as cardiovascular diseases, diabetes and cancer, make individuals more vulnerable to viral infection complications caused by the new coronavirus, progressing to the most severe form of the disease [2]. According to the National Cancer Institute (INCA), cancer patients undergoing chemotherapy or radiotherapy treatment, submitted to surgery in the previous year or using immunosuppressant drugs, belong to the high-risk group [3]. Recent studies have found that these patients exhibit a worse prognosis when infected by severe acute respiratory syndrome coronavirus 2 (Sars-CoV-2), in addition to high death rates [4].

Given the high contagion levels and the severity with which the disease can affect part of the population, several countries adopted preventive and control measures, social isolation being one of the main strategies [2,5]. Thus, since the onset of the pandemic, institutional changes in health services have occurred throughout the world in terms of the ongoing treatment of several conditions, including cancer treatment [6]. As a result, the contact of cancer patients with health professionals and their use of health services have been lower than before the pandemic [7].

However, evidence shows that to obtain satisfactory outcomes, no stage of cancer treatment should be interrupted, even though the likelihood of

contamination is high when patients leave social isolation to undergo treatment at health facilities. This situation causes a paradigm between the current pandemic and treatment adherence [8]. Additionally, social isolation resulted in lower participation in social activities and less interaction with family and friends, an essential emotional support network for cancer patients, thereby compromising their well-being [9]. An aggravating factor is that cancer patients are more likely to display psychic manifestations when compared to the general population. These include depression and anxiety during diagnosis and treatment, negatively impacting the quality of life of these individuals [10].

Thus, given the current situation, it is important to assess the impacts and identify the emergence of possible manifestations of anxiety, depression, stress, and other symptoms in cancer patients, resulting from the crisis caused by the new coronavirus. Thus, the aim of the present study was to assess the impact of COVID-19 on the follow-up of cancer treatment, as well as participation in social activities, such as physical exercise, to identify the repercussion of this scenario on the emotional state of patients diagnosed with cancer in Brazil.

Methods

Study design

This is a cross-sectional study conducted using an online questionnaire for patients with cancer, to collect data on the perceptions and repercussions of their treatment during the COVID-19 pandemic. The study was conducted in line with National Health Council Resolution 466/12. After approval by the Research Ethics Committee of the *Federal Universidade Federal do Ceará* (4.084.326), data were collected on a questionnaire applied through social media in July and August 2020.

Population and sample

The population was composed of individuals diagnosed with cancer. Individuals were invited to participate in the study via a link that contained the questionnaire disseminated in social media. Non-probability sampling by

convenience (“snowball”) was used. Included were patients with cancer, irrespective of the type and stage of the disease, diagnosed before or during the onset of the pandemic in Brazil (February 2020), regardless of sex, aged 18 years or older.

Data collection instrument

A questionnaire was created by the researchers and applied online. Participants were initially invited to access the formula and provide written informed consent. Those who declined were directed to a thank you page.

The questions addressed social and demographic questions related to the health status of cancer patients during the COVID-19 pandemic, including type of cancer, time since diagnosis, interventions, and possible treatment discontinuation due to the pandemic. In addition, the presence of flu symptoms and COVID-19 diagnosis was investigated, as well as the impact of the pandemic on the physical activity levels of cancer patients. Also assessed was the emotional state of these individuals using the Depression, Anxiety and Stress Scale (DASS-21).

The original DASS contains 42 items divided into three factors. However, a shorter version of the instrument containing 21 items (DASS-21) has been applied in different countries and translated and validated for Portuguese [11]. DASS-21 is a set of three self-reported 4-point Likert subscales, each consisting of 7 items that evaluate the emotional states of depression, anxiety, and stress.

Statistical analysis

The paired student’s t-test for normally distributed data (parametric) was used to analyze and compare the measures and the Wilcoxon test for non-normal distribution (non-parametric). Pearson’s and Spearman’s correlation coefficients for parametric and nonparametric variables, respectively, were applied to determine the existence of a relationship between the variables.

Quantitative variables were tabulated and analyzed using the SPSS (Statistical Pack for the Social Sciences) program, version 23.0. The results were

presented in tables and analyzed descriptively using the mean and standard deviation. The significance level was set at 95% ($p < 0.05$).

Results

A total of 105 individuals (96 women and 9 men) diagnosed with cancer took part in the study. Table I contains the demographic data and clinical characteristics of the study participants. The average age, weight and BMI of the subjects was 39 ± 12.2 years, 70.1 ± 17.5 kg, and 26.8 ± 7.3 kg/m^2, respectively. Most of the patients were from the Northeast (27.6%) and Southeast (28.6%) of Brazil, married (52.4%), with an average of 1.2 ± 1.1 children.

With respect to type of cancer, 50.5% were diagnosed with breast cancer and 20% hematological and lymphatic cancer. The other individuals reported a varied diagnosis in terms of tumor location, including urogynecological, lung, bone, gastrointestinal tract (GIT), head and neck and metastatic. The average time since diagnosis was 0.93 ± 0.97 years, demonstrating a positive correlation between age and time since diagnosis ($r = 0.308$, $p = 0.001$). Among the participants, 92.4% had started chemotherapy treatment, 59% had undergone surgery to remove tumors, 48.6% had been submitted to radiotherapy, 3.8% to transplant and 23.8% to hormone therapy (Table I).

The Depression, Anxiety and Stress Scale (DASS-21) was used to assess the emotional state of participants during the pandemic. The average score for depression was 4.75 ± 4.25, anxiety 4.5 ± 3.9 and stress 7.4 ± 4.75, showing a positive correlation between the depression and anxiety scores ($r = 0.659$, $p = 0.000$) and stress ($r = 0.758$, $p = 0.000$), as well as between anxiety and stress ($r = 0.752$, $p = 0.000$).

These scores were correlated with age and time since diagnosis. There was a negative correlation between age and stress ($r = -0.206$, $p = 0.035$), in which the younger the age, the greater the stress, and no significant correlation was observed between time since diagnosis and the emotional state of the individuals. Furthermore, the emotional state of the patients was assessed according to the type of treatment, including chemotherapy, radiotherapy, and surgery. Individuals submitted to surgery were more anxious than nonsurgical

patients (p = 0.002) (Table II). There was no association between chemotherapy and radiotherapy and emotional state.

Table I - *Demographic data and clinical characteristics of the cancer patients*

Variables	Mean ± SD
Age	39 ± 12.2
Weight (kg)	70.1 ± 17.5
BMI (kg/m²)	26.8 ± 7.3
Sex	
Female	96 (91.4)
Male	9 (8.6)
Birthplace by region, n (%)	
North	3 (2.9)
Northeast	29 (27.6)
Midwest	8 (7.6)
Southeast	30 (28.6)
South	5 (4.8)
Marital status, n (%)	
Single	33 (31.4)
Married	55 (52.4)
Divorced	13 (12.4)
Widowed	4 (3.8)
Number of children	1.2 ± 1.1
Type of cancer, n (%)	
Breast	53 (50.5)
Urogynecological	9 (8.6)
Hematological and lymphatic	21 (20)
GIT	4 (3.8)
Head and neck	8 (7.6)
Bone	2 (1.9)
Lung	1 (1)
Metastatic	7 (6.7)
Time since diagnosis, years	0.93 ± 0.97
Type of treatment, n (%)	
Chemotherapy	97 (92.4)
Surgery	62 (59)
Radiotherapy	51 (48.6)
Transplant	4 (3.8)
Hormone therapy	25 (23.8)
Others	6 (5.7)

BMI = body mass index; GIT = gastrointestinal tract

Table II - *Associations between anxiety, depression, and stress of cancer patients in relation to previous surgery*

Previous surgery	Mean ± SD	p
DASS-21 Depression		
Yes (n = 62)	5.22 ± 4.73	0.107
No (n = 43)	4.04 ± 3.51	
DASS-21 Anxiety		
Yes (n = 62)	5.13 ± 4.31	0.002*
No (n = 43)	3.65 ± 3.10	
DASS-21 Stress		
Yes (n = 62)	7.85 ± 5.15	0.051
No (n = 43)	6.69 ± 4.05	

DASS-21 = Depression, Anxiety and Stress Scale; *p < 0.05

To assess the impact of the COVID-19 pandemic on the medical follow-up and cancer treatment of these individuals, they were questioned regarding treatment abandonment and examination or appointment cancellation due to the

pandemic. Only 16.2% (n = 17) of individuals reported abandoning cancer treatment. However, 42.9% (n = 45) cancelled examinations or appointments in this period. An association between this aspect and emotional state demonstrated that individuals who cancelled examinations and appointments obtained higher stress (p = 0.002), depression (p = 0.002) and anxiety (p = 0.011) scores (Table III).

Table III - *Associations between anxiety, depression and stress of cancer patients who cancelled appointments and examinations during the COVID-19 pandemic*

Cancelling appointments and examinations	Mean ± SD	p
DASS Depression		
Yes (n = 45)	6.20 ± 4.28	0.002*
No (n = 60)	3.65 ± 3.99	
DASS Anxiety		
Yes (n = 45)	5.64 ± 4.34	0.011*
No (n = 60)	3.68 ± 3.36	
DASS Stress		
Yes (n = 45)	8.97 ± 4.47	0.002*
No (n = 60)	6.18 ± 4.62	

*p < 0.05

Most participants (92.4%) reported being fearful of coronavirus contamination, but only 3.8% of these individuals were diagnosed with COVID-19 and did not require hospitalization. The individuals were also questioned about symptoms, such as cough, fever, diarrhea, shortness of breath, sore throat, and body aches in the previous 2 months, and more than half (55.2%, n = 58) exhibited no symptoms. However, 9.5% reported dry cough, 7.6% fever, 13.3% diarrhea, 6.7% shortness of breath, 16.2% sore throat and 29.5% body aches.

Three of the four individuals diagnosed with COVID-19 during this period reported fever, two dry cough, shortness of breath and body aches, and one diarrhea and sore throat. An association between symptoms and emotional state revealed that those with no symptoms were less anxious (p = 0.043). However, there was no association between symptoms and depression and stress scores (Table IV).

Participants were also questioned about physical activity before and during the COVID-19 pandemic, which is also associated with the DASS-21 questionnaire. More than half (n = 53, 50.5%) engaged in physical activity before the pandemic, but during the pandemic only 37 individuals (35.2%) had exercised in the previous 2 months. The association between emotional state and physical

activity during the pandemic showed that those who did not engage in physical activity obtained a higher depression score (p = 0.03). However, there was no association between anxiety and stress scores and engaging in exercise (Table V).

Table IV - *Associations between the anxiety, depression, and stress of cancer patients with no symptoms during the COVID-19 pandemic*

No symptoms	Mean ± SD	p
DASS Depression		
Yes (n = 58)	4.36 ± 4.17	0.315
No (n = 47)	5.21 ± 4.44	
DASS Anxiety		
Yes (n = 58)	3.82 ± 3.71	0.043*
No (n = 47)	5.38 ± 4.03	
DASS Stress		
Yes (n = 58)	6.62 ± 4.80	0.068
No (n = 47)	8.31 ± 4.55	

*p < 0.05

Table V - *Associations between the anxiety, depression and stress of cancer patients and physical activity during the COVID-19 pandemic*

Physical activity in the previous 2 months	Mean ± SD	p
DASS Depression		
Yes (n = 37)	3.51 ± 3.46	0.03*
No (n = 68)	5.41 ± 4.56	
DASS Anxiety		
Yes (n = 37)	4.67 ± 3.71	0.771
No (n = 68)	4.44 ± 4.05	
DASS Stress		
Yes (n = 37)	6.29 ± 3.92	0.084
No (n = 68)	7.97 ± 5.06	

*p < 0.05

In addition, most participants reported feeling tired (n = 93, 88.6%) and a direct impact on their quality of life (n = 102, 97.2%) during this period. However, there was no significant association between feeling tired and engaging in physical activity.

Discussion

The present study sought to assess the impact of the COVID-19 pandemic on the overall health status of cancer patients, identifying the influence of the social isolation period on the continuity of cancer treatment, scheduling appointments and examinations, physical activity level and the emotional state of these individuals. The sample consisted primarily of young adult women

diagnosed with cancer in the previous year. A large portion of the participants reported an impact of the pandemic on their quality of life and fear of contamination with the new coronavirus.

At the time of this study, Brazil had recorded nearly 100,000 deaths from COVID-19. The disease is present in 98.8% of Brazilian municipalities, with a mortality rate that ranged from 6.9% (May) to 3.4% (August) [12]. Studies have demonstrated that the new coronavirus outbreak triggered not only the risk of contracting the disease and dying, but also psychological problems due to strict social isolation, which gradually separates people and changes their routines, as well as the critical situation of collapsed health systems associated with the fear of contamination [13,14].

A study conducted in Italy at the onset of the pandemic assessed the perception of young cancer patients (between 15 and 21 years) regarding the risk of contamination and stress levels and found that many individuals were fearful of being contaminated and developing serious complications from the disease, which may be related to the higher stress levels of these patients [15]. In the present study, correlating between the variables and emotional state showed that the younger the individuals, the more stressed they were.

Cancer patients are at risk of being contaminated with the coronavirus because of their greater likelihood of developing a severe form of the disease [16,17]. Thus, fear of contamination may have been the primary factor that raised the number of cancelled appointments and examinations in the present study, given that more than 90% of participants expressed fear of being contaminated with the new coronavirus. This may have had a direct impact on the emotional state of these individuals, who were more anxious, stressed, and depressed.

Despite the high percentage of participants who cancelled appointments and examinations, slightly more than 15% reported interrupting cancer treatment during the pandemic. However, studies have demonstrated that COVID-19 has had a direct impact on cancer treatment and that patients have experienced problems caused by late diagnosis. Berardi *et al.* [18] showed that surgeries and other procedures have been affected by the pandemic in a leading cancer center in Italy, with a significant decline in procedures conducted in 2020 when compared to the previous year. Another study conducted with 555 patients with

ovarian cancer found that 33% interrupted some stage of their treatment, including delaying surgery and canceling appointments and examinations [19].

These healthcare changes as well as other pandemic-related factors have occurred worldwide. A study in the United Kingdom identified delays, interruptions and even changes in cancer treatment [20]. Other studies have demonstrated an increase in symptoms of anxiety and depression in cancer patients in Italy and China. Some individuals met the diagnostic criteria for post-traumatic stress disorder (PTSD), women and younger patients being the most affected [21,22]. In Holland, the follow-up or treatment of many cancer patients changed, causing them considerable concern [23]. Thus, extending social distancing as a preventive measure to avoid contamination will likely have significant impacts on cancer patients [20].

Physical activity is a good alternative to prevent the considerable impact of the pandemic on the emotional state and consequently the quality of life of this population. Physical exercise is directly related to an improvement in quality of life, muscle, and aerobic aptitude, as well as mental health, thereby reducing the fatigue commonly experienced by these individuals [24,25].

In the present study, individuals who engaged in physical activity in the previous 2 months were less depressed. Moreover, those who did not exhibit flu symptoms that could be related to COVID-19, were less depressed, anxious, and stressed. The pandemic may have impacted the physical activities of some cancer patients, since this study observed a decrease in the number of individuals who engaged in physical exercise during the pandemic when compared to before it. This could have contributed to the emotional state of the participants during the pandemic.

Most of the participants reported fatigue and a direct impact of the pandemic on their quality of life during this period. However, there was no significant correlation between fatigue and physical activity. Nevertheless, studies demonstrate a positive contribution of physical exercise in managing treatment side effects, in addition to increasing tolerance to them, fatigue being the most common symptom experienced by cancer patients [26,27].

Conclusion

As observed worldwide, the COVID-19 pandemic has had a direct impact on the emotional state and quality of life of cancer patients in Brazil. The fear of contamination and changes in diagnosis and cancer treatment may be related to the symptoms of anxiety, depression and stress experienced by this population. The pandemic may also have been responsible for the decline in physical activity, which could contribute even more to the negative impact on the quality of life of these individuals.

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Conflict of interests

We certify that this study have no affiliations with or involvement in any organization or entity.

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