Impact of the COVID-19 pandemic on the life-space mobility of older adults with cancer

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1. Introduction

The coronavirus disease 2019 (COVID-19) has led to a pandemic that challenges societies worldwide. In Brazil a mathematical projection has predicted that at the end of the pandemic, the country will have more than 240,000 deaths, of which 175,000 will be older adults [1]. Since March 2020, social distancing has been encouraged as the primary strategy for controlling the disease, especially for high-risk individuals. Despite being a powerful weapon against COVID-19, many older adults adapt poorly to it.

Many factors are related to a decrease in their quality of life such as being housebound with no visitors, inevitable changes to diet, lack of physical exercise, reduced cognitive stimulation, withdrawal of functional support and rehabilitation therapies; that ultimately could lead to physical frailty and functional disability [2–4]. Cancer itself has been associated with an increased risk of mortality from COVID-19 [5], and it has been recommended to reevaluate interventions to avoid unnecessary exposure [6]. It is also is known that older patients with cancer are particularly vulnerable to physical and psychological distress [7]. Therefore, we aimed to evaluate the impact of the COVID-19 pandemic on the physical and psychological health and treatment of older outpatients with cancer.

2. Methods

2.1. Design, Setting, and Participants

We performed a case-control study based on structured telephone interviews designed to assess the impact of the COVID-19 pandemic on the health of older outpatients with or without cancer. Patients aged 60 years and older were recruited from the geriatric oncology clinic (with cancer) and the outpatient geriatric clinic (without cancer) from Hospital das Clinicas, University of Sao Paulo Medical School (HCFMUSP). Electronic databases were assessed to identify eligible candidates, using previously documented comprehensive geriatric assessments.

We excluded patients with dementia, severe dependence for activities of daily living, and those unable to effectively communicate using the telephone. Also we excluded patients who needed to make frequent hospital visits (weekly) due to oncological treatment during the study period (given that they experienced less restrictive social isolation).

The local institutional review boards has officially reviewed and approved the study, and verbal consent was obtained from patients before the interviews. Data was collected and securely managed using the Research Electronic Data Capture platform.

2.2. Measurements

Data was retrieved from medical records for sociodemographic factors, medical history, frailty according to the FRAIL scale, and last Eastern Cooperative Oncology Group Performance Status scoring (ECOG), for the cancer group. Subsequently, our investigators completed the baseline assessments using a 20 min structured telephone interview, in May 2020. The patients were asked whether they were following the news about the COVID-19 and their level of concern about the pandemic. They also provided information on treatment adherence, contact precaution measures, and influenza vaccine status.

We assessed the following instruments to assess psychological health: the 3-Item UCLA Loneliness Scale (UCLA-3) and the 4-Item Patient Health Questionnaire (PHQ-4), which evaluates depression and anxiety. We also investigated the impact of the pandemic on quality of life using the following question: "How is the coronavirus pandemic affecting your quality of life?" – to which patients could respond "not at all", "to some extent", or "to a great extent".

We administered the Life-Space Assessment (LSA) to assess physical health (estimates the ability to move from one's home to the greater community). We also evaluated physical activity using the International Physical Activity Questionnaire (IPAQ) Short Form. To assess the pandemic's impact on life-space mobility and physical activity levels, we investigatedtwo time points: before the quarantine (February 2020) and during the quarantine. We defined major reduction in life-space mobility as a decrease of ≥20 points in the LSA score [8].

We also investigated other aspects about our participants with cancer, such as having a telephone appointment from an oncologist, interruption or postponement of cancer treatments, and whether they were more afraid of cancer or COVID-19.

2.3. Statistical Analyses

First, we matched patients with cancer from the geriatric oncology clinic with patients without cancer from the outpatient geriatric clinic. We paired cases and controls using data from an electronic database according to age, sex, literacy level, and frailty status. Second, we described continuous variables as means and standard deviations (SD) and categorical variables as counts and percentages. Third, we compared the characteristics between cases and controls using the Student's t-test or the Mann-Whitney test for continuous variables, and the exact Fisher test for categorical variables. Finally, we explored logistic regression models to investigate whether the diagnosis of cancer was associated with psychological and physical measures found significant in the univariate analysis. We presented the associations as adjusted odds ratios (OR) with their corresponding 95% confidence intervals (CI).

Statistical analyses were performed using Stata version 14.2 (Stata Corp. LP, College Station, TX, USA). All statistical tests were two-tailed, and an alpha level of less than 0.05 was used to indicate statistical significance.

3. Results

A total of 75 patients with cancer (cases) were matched with 125 patients without cancer (controls), with a mean age of 78 (SD ±7) years (Table 1). For the cancer group, the most frequent sites were prostate (32%), gastrointestinal tract (19%), and breast cancer (15%). Most patients had stage III (35%) or IV diseases (31%), and 52% had an ECOG of 1.

When questioned about COVID-19's impact, the two groups did not differ (Table 1). Adherence to preventive measures against the disease was generally good. The prevalence of anxiety was relatively high, affecting 21% of our sample, but we did not observe significant differences between groups regarding psychological health. When asked about the impact of the COVID-19 pandemic on their quality of life, 73% of our participants replied that the pandemic had affected them to some or, to a great extent, with no difference between groups. In the cancer group, only four patients discontinued medications during the pandemic, and 20% received medical appointments by telephone.

Although the two groups did not differ in the physical activity measure, we observed a higher impact of the COVID-19 pandemic on the life-space mobility of participants with cancer compared to those without (Fig. 1). While 73% of the first group experienced a major reduction in their life-space mobility, the same was true for only 47% of the second ($p < 0.001$). Because the cancer group had higher LSA levels before the quarantine when compared to the non-cancer group, we adjusted our multivariable analysis for baseline LSA scores. We found that having

Table 1
Characteristics of the study participants ($n = 200$).

		Total sample	Without cancer	With cancer	p-value*
		($n = 200$)	($n = 125$)	($n = 75$)	
Age (years), mean (SD)		78.3 (7.3)	78.2 (7.0)	78.5 (7.9)	0.805
Age group	60–69 years, n (%)	25 (12.5)	14 (11.2)	11 (14.7)	0.314
	70–79 years, n (%)	96 (48.0)	66 (52.8)	30 (40.0)	
	80–89 years, n (%)	67 (33.5)	39 (31.2)	28 (37.3)	
	≥90 years, n (%)	12 (6.0)	6 (4.8)	6 (8.0)	
Literacy (years), mean (SD)		6.2 (5.2)	6.2 (5.4)	6.1 (5.1)	0.884
Female sex, n (%)		86 (43.0)	56 (44.8)	30 (40.0)	0.557
Married, n (%)		101 (50.5)	63 (50.4)	38 (50.7)	0.930
Living alone, n (%)		33 (16.5)	10 (16.0)	13 (17.3)	0.643
Diabetes, n (%)		69 (34.7)	46 (36.8)	23 (31.1)	0.444
Heart failure, n (%)		36 (18.0)	25 (20.0)	11 (14.7)	0.447
COPD, n (%)		20 (10.0)	10 (8.0)	10 (13.3)	0.233
Cognitive Performance (10-CS), mean (SD)		8.1 (1.5)	8.2 (1.3)	8.0 (1.7)	0.500
Frail (FRAIL Scale ≥3), n (%)		45 (22.5)	30 (24.0)	15 (20.0)	0.601
Reported gait difficulty, n (%)		76 (38.0)	50 (40.0)	26 (34.7)	0.547
Use of mobility assist device, n (%)		47 (23.5)	30 (24.0)	17 (22.7)	0.865
Influenza vaccination, n (%)		154 (77.0)	100 (80.0)	54 (72.0)	0.225
How worried are you	not at all, n (%)	42 (21.0)	29 (23.2)	13 (17.3)	0.530
about the coronavirus	somewhat, n (%)	71 (35.5)	45 (36.0)	26 (34.7)	
pandemic?	very much, n (%)	87 (43.5)	51 (40.8)	36 (48.0)	
How often are you	never, n (%)	4 (2.0)	3 (2.4)	1 (1.3)	0.765
checking the news	sometimes, n (%)	26 (13.0)	15 (12.0)	11 (14.7)	
about coronavirus?	daily, n (%)	170 (85.0)	107 (85.6)	63 (84.0)	
How is the coronavirus	not at all, n (%)	53 (26.8)	36 (29.3)	17 (22.7)	0.443
pandemic affecting	to some extent, n (%)	84 (42.4)	48 (39.0)	36 (48.0)	
your quality of life?	to a greater extent, n (%)	61 (30.8)	39 (31.7)	22 (29.3)	
Receiving less frequent visits from friends and family, n (%)		117 (58.5)	68 (54.4)	49 (65.3)	0.141
Physical activity before quarantine (min./week), mean (SD)		61.1 (94.8)	57.4 (88.5)	67.2 (104)	0.482
Physical activity during quarantine (min./week), mean (SD)		33.0 (76.5)	29.9 (67.9)	38.1 (89.2)	0.465
Loneliness (UCLA-3 ≥ 6), n (%)		29 (14.5)	20 (16.0)	9 (12.0)	0.536
Depression (PHQ-2 ≥ 3), n (%)		25 (12.5)	20 (16.0)	5 (6.7)	0.076
Anxiety (GAD-2 ≥ 3), n (%)		41 (20.5)	31 (24.8)	10 (13.3)	0.070
Life-Space Assessment before the quarantine, mean (SD)		47.3 (225)	44.3 (20.6)	52.3 (24.6)	0.014
Life-Space Assessment during the quarantine, mean (SD)		20.0 (14.8)	24.0 (21.7)	13.4 (15.6)	<0.001
Major Reduction in Life-Space Mobility,# n (%)		114 (57.0)	59 (47.2)	55 (73.3)	<0.001

Abbreviations: COPD, Chronic Obstructive Pulmonary Disease; 10-CS, 10-point Cognitive Screener; UCLA-3, 3-item UCLA Loneliness Scale; PHQ-2, Patient Health Questionnaire 2-item; GAD-2, Generalized Anxiety Disorder 2-item; SD, standard deviation.

* Student's t-test was used to compare interval data and the Fisher test was used to compare categorical data between groups.

Major reduction in life-space mobility was defined by a decrease of 20 or more points in the total Life-Space Assessment score.
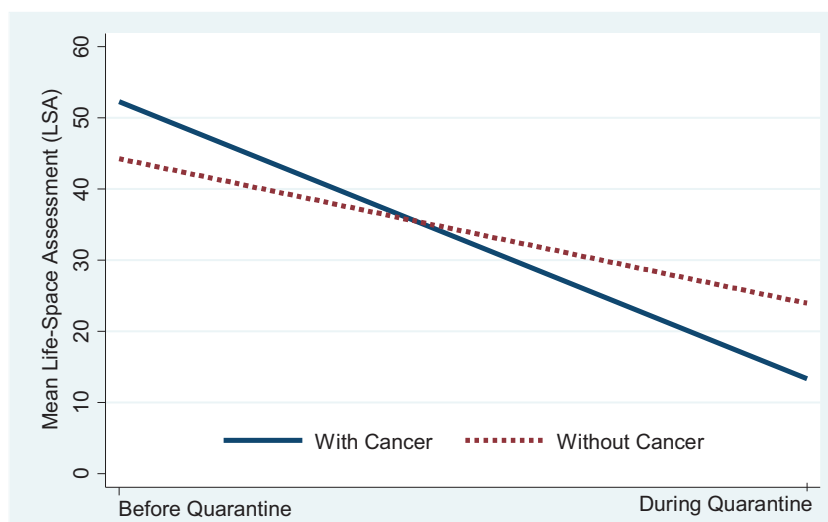
Fig. 1. Profile plots representing mean life-space assessments before and during the quarantine.

cancer was independently associated with experiencing a major life-space reduction during the COVID-19 pandemic, with an adjusted OR of 3.79 (95%CI = 1.54–9.34). Factors such as cancer subtype or staging, and treatment modalities had some impact on the occurrence of major LSA reduction, but this did not reach statistical significance. When asked, 70% of the participants of the cancer group reported being more afraid of COVID-19 than of cancer.

4. Discussion

In this case-control study, we provide preliminary evidence on the impact of the COVID-19 pandemic on older adults' physical and psychological health, comparing patients with and without cancer. While the psychological health between the two groups was similar, older outpatients with cancer were almost four times more likely to experience a major reduction in their life-space mobility.

To the best of our knowledge, this is the first study to assess the impact of the COVID-19 pandemic on older outpatients with cancer compared to a control group. While it is still unclear what will be the consequences of abrupt lifestyle changes on the health of older adults [9], research prior to the pandemic suggests that a decrease in life-space mobility predicts short-term mortality among older patients even after adjusting for co-morbidities. Furthermore, it has been demonstrated that major reductions in life-space mobility strongly predicts adverse outcomes in older adults, including falls, hospitalization, and disability [10].

Although no significant difference was found between the studied groups, our participants reported a substantial impact of the pandemic on their quality of life. We also observed a high prevalence of anxiety in our overall sample. Interestingly, patients with cancer were more frightened by COVID-19 than by cancer itself, quite an uncommon situation in oncological patients, which may explain the significant decrease in their life-space mobility. Rigorous physical distancing measures could affect several health domains and must be accounted for by oncological centers' multidisciplinary teams.

This investigation had limitations. Our sample was recruited from a single tertiary university medical and might have limited generalizability. Notably, we excluded patients who were still frequently visiting our oncology clinic during the pandemic; it is possible that they might also have experienced important issues related to the physical distancing recommendations, but that we were unable to assess. Therefore, our findings should be tested and confirmed in other oncological settings and populations.

In conclusion, older outpatients with cancer presented a more significant decrease in life-space mobility than those without cancer during the pandemic. Providers should explore strategies (e.g., home-based exercise, outdoor walks) to mitigate the pandemic's negative consequences on the physical health of older oncological patients. We plan to follow our sample to advance our knowledge regarding the impact of the abrupt lifestyle changes caused by COVID-19 during the subsequent months.

Author's Disclosures of Potential Confliscts of Interest

All authors declare no potential conflict of interest to disclose.

Author Contributions

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