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Research Article

Prevalence and Characteristics of the Physical Activity in a Sample of Patients Undergoing Oncological Treatments

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Abstract

International guidelines include regular physical activity (PA) as a recommendation for cancer patients. Methods. Prevalence and frequency of regular PA, psychological status, as measured by Hospital Anxiety and Depression Scale (HADS), complementary and alternative medicine (CAM) use, treatment side-effects, clinical and sociodemographic characteristics have been measured in 405 patients (51.11% males). Results. 127 (31.36%) of them practiced PA. In the multivariate logistic regression, the PA was strongly and independently associated with CAM and dietary supplements use (OR 2.18; 95%CI 1.11-2.81; p-value = 0.024), and (negatively) with HADS-Depression (OR 0.26; 95%CI 0.12-0.55; p-value < 0.001), and fatigue (OR 0.55; 95%CI 0.34-0.87; p-value = 0.011) after adjustment for age, gender, and severity of cancer. **Conclusions:** Despite the documented benefits of PA, a large proportion of cancer patients do not reach the recommended levels of PA, suggesting that we need to find ways to make PA a standard part of cancer care, to detect case of depression and to treat fatigue. Professionals who work with cancer patients must be trained about how best to help cancer patients become physically active. Really important is to be connected in a network of specialists to "treat the patient" and not only his/her cancer.

Keywords: Physical activity; Oncological patient; Anxiety; Depression; Fatigue; CAM

Introduction

Today, the importance of physical activity (PA), and the underlying biological mechanisms, in the prevention of cancer are well known [1,2]. Both meta-analysis and review of clinical randomized trials reported beneficial effects of physical exercise during and after antineoplastic treatments [3-5]. From the first study [6], many others have been published on the inverse relationship between cancer mortality and PA. PA is associated with various site-specific cancers in many ways. PA reduce cancer incidence, cancer progression, cancer recurrence and impact survival rates; it has an important role in the prevention of neoplastic disease, as a support during oncological treatments, in post-treatment and follow up [7-9]. In breast cancer, PA during adjuvant therapy reduce loss of muscle strength and cancer-related fatigue. Duration and intensity of PA also play an important role: longer exercise sessions or exercising with higher intensity will result in a greater reduction in cancer risk. Despite international guidelines include regular PA as a recommendation for cancer patients [2,9], we need to explore how increase PA among cancer patients that undergoing treatment.

The principal aim of this study was to measure the prevalence of PA among cancer patients being treated at a large Italian university hospital and the associated characteristics.

Materials and methods

This survey involved more than 400 patients who voluntarily agreed to answer an anonymous questionnaire while they were in the waiting room for their scheduled oncological visit, in this single center, cross-sectional study.

A clinician gave information about the study, and obtained study consent from patients. Before the visit, a researcher gave patients the questionnaires and they individually completed them. If necessary, help was provided.

This study was approved by the "Sapienza" Ethics Committee (CE REF:7086/2023), and all subjects provided written informed consent. The study is conducted in accordance with the Declaration of Helsinki, and data were collected between October and November 2023.

Instruments

Regular physical activity (gymnastics, swimming, brisk walking) and frequency (occasionally/ habitually) have been explored.

Sociodemographic, clinical and lifestyle data (gender, age, marital status, years of school, family history of oncological pathologies, diagnosis, surgery, chemotherapy, radiotherapy, immunotherapy, hospitalization, cancer severity, side-effects, diet, alcohol and smoking, Complementary and Alternative Medicine (CAM) and dietary supplements use) have also been collected.

Hospital Anxiety and Depression Scale [10] has been used to measure anxiety and depression status. HADS score > 11, in each domain, has been considered positive for anxiety or depression. In this study, the internal consistency of the scale was $\alpha = 0.91$.

Statistical Analysis

Data were presented as count (n) and percentage (%) or mean and standard deviation (SD), to describe demographic and clinical characteristics of the whole sample and separately for males and females or PA (no/yes) group.

For analysis purpose, patients were subdivided into four groups with respect to age (<56;56-65;66-75;>75), into two categories for years of education (<=8 years of school versus >8 years of school) and married status (no/yes). Data about severity was subdivided in 5 classes (very mild; mild; moderate; severe; very severe). Data about surgery, CHT, immunotherapy, radiotherapy, fatigue, articular or muscular pain, nausea, headache, hair loss were dichotomic (no/yes), as data about CAM and dietary supplements used, due to their heterogeneity.

The internal consistency of the HADS scale was estimated with a Cronbach alpha coefficient by the item-total correlations.

Multivariate regression models were built to assess the association between PA (compared to no-PA) and all variables resulted associates at the univariate analyses, while simultaneously adjusting for possible confounding factors as age, gender, and severity of cancer. Bivariate and multivariate odds ratios (ORs), and associated 95% confidence intervals (CIs) were estimated using logistic regression models.

All statistical analyses have been performed using STATA, version 11.0 (StataCorp, College Station, Tex).

Results

Among 405 patients (207; 51.11% males and 198; 48.89% females), 127 (31.36%) practiced PA and 278 (68.64%) didn't. Eighty-nine (22.14%) and 80 (19.90%) reported a HADS domain's score>11 and were classified as probable cases of clinical depression or anxiety, respectively. In Table 1 demographic and clinical characteristics are shown, separately by gender. Males resulted significantly older than females. Prevalence of lung and kidney-bladder cancer were higher in males. Differently, schooling, diet, CAM or dietary supplements, muscular pain, headache, hair loss, anxiety (as measured by HADS) and, partially, physical activity (p-value=0.090) were higher in females. No significant differences were observed on surgery, CHT, immunotherapy, radiotherapy, cancer severity, fatigue, nausea, and depression, as measured by HADS.

	All	Males	Females	
	N=405	207 (51.11%)	198 (48.89%	*p-value*[a]
Age (yrs); mean (SD)	64.63 (12.46)	68.06 (11.24)	61.02 (12.69)	*<0.001*
Age (yrs)				
31-55	99 (24.44)	30 (14.49)	69 (34.85)	
56-65	98 (24.20)	44 (21.26)	54 (27.27)	
66-75	118 (29.14)	74 (35.75)	44 (22.22)	
76+	90 (22.22)	59 (28.50)	31 (15.66)	*<0.001*
Married				
no	154 (38.02)	69 (33.33)	85 (42.93)	
yes	251 (61.98)	138 (66.67)	113 (57.07)	*0.047*
Schooling				
<8	149 (36.79)	95 (45.89)	54 (27.27)	
>8	256 (63.21)	112 (54.11)	144 (72.73)	*<0.001*
Cancer type				
lung	132 (32.59)	86 (41.55)	46 (23.23)	
breast	86 (21.23)	0	86 (43.43)	
colorectal	57 (14.07)	33 (15.94)	24 (12.12)	
pancreas	23 (5.68)	16 (7.73)	7 (3.54)	
kidney-bladder	20 (4.94)	18 (8.70)	2 (1.01)	
uterus-ovary	16 (3.95)	0	16 (8.08)	
prostate	15 (3.70)	15 (7.25)	0	
stomach	14 (3.46)	7 (3.38)	7 (3.54)	
other	42 (10.37)	32 (15.46)	10 (5.05)	*<0.001*
Familiarity k				
no	179 (45.45)	89 (43.00)	90 (45.45)	
yes	226 (55.80)	118 (57.00)	108 (54.55)	*0.618*
Surgery*				
yes	236 (58.27)	117 (56.52)	119 (60.10)	*0.465*
CHT*				
yes	334 (82.47)	165 (79.71)	169 (85.35)	*0.135*
Immunotherapy*				
yes	152 (37.53)	83 (40.10)	69 (34.85)	*0.276*
Radiotherapy*				
yes	179 (44.20)	93 (44.93)	86 (43.43)	*0.762*
Severity				
mild	10 (2.47)	4 (1.93)	6 (3.03)	
moderate	148 (36.54)	73 (35.27)	75 (37.88)	
severe	204 (50.37)	107 (51.69)	97 (48.99)	
very severe	43 (10.62)	23 (11.11)	20 (10.10)	*0.819*

Fatigue*				
yes	214 (52.84)	109 (52.66)	105 (53.03)	*0.940*
Articolar pain*				
yes	113 (27.90)	53 (25.60)	60 (30.30)	*0.292*
Muscolar pain*				
yes	111 (27.41)	47 (22.71)	64 (32.32)	*0.030*
Nausea				
yes	123 (30.37)	60 (28.99)	63 (31.82)	*0.535*
Heachache				
yes	28 (6.91)	8 (3.86)	20 (10.10)	*0.013*
Hair loss				
yes	90 (22.22)	31 (14.98)	59 (29.80)	*<0.001*
Diet				
no	305 (75.31)	171 (82.61)	134 (67.68)	
yes	100 (24.69)	36 (17.39)	64 (32.32)	*0.001*
CAM+supplements				
no-no	157 (38.77)	108 (52.17)	49 (24.75)	
yes-no	24 (5.93)	10 (4.83)	14 (7.07)	
no-yes	149 (36.79)	68 (32.85)	81 (40.91)	
yes-yes	75 (18.52)	21 (10.14)	54 (27.27)	*<0.001*
Physical activity				
no	278 (68.64)	150 (72.46)	128 (64.65)	
yes	127 (31.36)	57 (27.54)	70 (35.35)	*0.090*
Depression- HADScale				
below cutoff (11)	313 (77.86)	159 (77.94)	154 (77.78)	
above cutoff (11+)	**89 (22.14)**	45 (22.06)	44 (22.22)	*0.969*
Anxiety- HADScale				
below cutoff (11)	322 (80.10)	174 (85.29)	148 (74.75)	
above cutoff (11+)	80 (19.90)	30 (14.17)	50 (25.25)	*0.008*

a: Chi square test

* NO= complement to 405

Table 1: Demographic and clinical characteristics, separate by males and females (N; %).

In Table 2 demographic and clinical characteristics are reported, separately by PA.

	All	No	Yes			
	N=405	N=278 (68.64%)	N=127 (31.36%)	*p-value*[a]	OR[b] (95%CI)	OR[c] (95%CI)
Gender						
males	207 (51.11)	150 (53.96)	57 (44.88)		1	1
females	198 (48.89)	128 (46.04)	70 (55.12)	*0.090*	1.44 (0.94-2.19)	1.08 (0.66-1.77)
Age (yrs)						
31-55	99 (24.44)	58 (20.86)	41 (32.28)		1	1
56-65	98 (24.20)	67 (24.10)	31 (24.41)		0.65 (0.36-1.17)	0.65 (0.35-1.21)
66-75	118 (29.14)	77 (27.70)	41 (32.28)		0.75 (0.43-1.31)	0.86 (0.47-1.58)
76+	90 (22.22)	76 (27.34)	14 (11.02)	*0.001*	**0.26 (0.13-0.52)**	0.36 (0.17-0.77)
Cancer type						
lung	132 (32.59)	98 (32.35)	34 (26.77)		1	
breast	86 (21.23)	53 (19.06)	33 (25.98)		**1.79 (1.00-3.22)**	
colorectal	57 (14.07)	32 (11.51)	25 (19.69)		**2.25 (1.72-4.32)**	
pancreas	23 (5.68)	18 (6.47)	5 (3.94)		0.80 (0.28-2.32)	
kidney-bladder	20 (4.94)	14 (5.04)	6 (4.72)		1.24 (0.44-3.47)	
uterus-ovary	16 (3.95)	13 (4.68)	3 (2.36)		0.67 (0.18-2.48)	
prostate	15 (3.70)	10 (3.60)	5 (3.94)		1.44 (0.46-4.52)	
stomach	14 (3.46)	11 (3.96)	3 (2.36)		0.79 (0.21-2.99)	
other	42 (10.37)	29 (10.43)	13 (10.24)	*0.208*	1.29 (0.60-2.77)	
Severity						
mild	10 (2.47)	5 (1.80)	5 (3.94)		1	1
moderate	148 (36.54)	95 (34.17)	53 (41.73)		0.58 (0.15-2.02)	0.82 (0.22-3.09)
severe	204 (50.37)	141 (50.72)	63 (49.61)		0.45 (0.12-1.60)	0.60 (0.16-2.24)
very severe	43 (10.62)	37 (13.31)	6 (4.72)	*0.029*	**0.16 (0.04-0.73)**	0.34 (0.07-1.66)
Fatigue						
no	191 (47.16)	116 (41.73)	75 (59.06)		1	1
yes	214 (52,84)	162 (58.27)	52 (40.94)	*0.001*	**0.50 (0.32-0.76)**	**0.55 (0.34-0.87)**
Articolar pain						
no	292 (72.10)	193 (69.42)	99 (77.95)		1	
yes	113 (27.90)	85 (30.58)	28 (22.05)	*0.076*	0.64 (0.39-1.05)	
Muscolar pain						
no	294 (72.59)	194 (69.78)	100 (78.74)		1	
yes	111 (27.41)	84 (30.22)	27 (21.26)	*0.061*	0.63 (0.38-1.02)	
CAM+supplements						
no-no	157 (38.77)	119 (42.81)	38 (29.92)		1	1
yes-no	24 (5.93)	16 (5.76)	8 (6.30)		1.57 (0.62-3.94)	1.39 (0.51-3.75)
no-yes	149 (36.79)	99 (35.61)	50 (39.37		1.58 (0.96-2.61)	1.61 (0.93-2.81)
yes-yes	75 (18.52)	44 (15.83)	31 (24.41)	*0.056*	**2.21 (1.23-3.97)**	**2.18 (1.11-2.81)**

Depression HADS						
below cutoff (11)	312 (77.86)	195 (70.91)	118 (92.91)		**1**	1
above cutoff (11+)	**89 (22.14)**	80 (29.09)	9 (7.09)	*<0.001*	**0.19 (0.09-0.38)**	**0.26 (0.12-0.55)**
Anxiety- HADS						
below cutoff (11)	322 (80.10)	210 (76.36)	112 (88.19)		1	
above cutoff (11+)	80 (19.90)	65 (23.64)	15 (11.81)	*0.006*	**0.43 (0.24-0.79)**	

OR: odds ratio; CI: confidence intervals.

a: Chi square test

b: Odds ratio adjusted for age

c: Odds ratio adjusted for gender, age, severity

Table 2: Demographic and clinical characteristics, separately by physical activity (no/yes) (N; %).

In the multivariate logistic regression final analysis, the PA was strongly and independently associated with CAM and dietary supplements use (OR 2.18; 95%CI 1.11-2.81; p-value = 0.024), and (negatively) with HADS-Depression (OR 0.26; 95%CI 0.12-0.55; p-value < 0.001), and fatigue (OR 0.55; 95%CI 0.34-0.87; p-value = 0.011) after adjustment for age, gender, and severity of cancer.

Discussion

In this study, the percentage of those who practice regular activity is around 30%. If we excluded 123 patients, older than 75 years or with a very serious pathology, this percentage not have changed much (37%).

Despite the documented benefits of PA a large proportion of cancer patients do not reach the recommended levels of PA, suggesting that we need to find ways to make PA a standard part of cancer care.

Although only a minority of patients under treatment, in this study, revealed that they regularly do physical activity, some PROs and CONs were highlighted.

As expected, patients' perception of illness as severe, the presence of fatigue, as cancer and treatments side-effect, age >75 years, were associated with not practicing PA. Differently, the use of supplements and complementary medicines was associated with carrying out regular physical activity, as gymnastics, swimming, brisk walking.

Despite the demonstrated benefits of physical activity and exercise for cancer survivors [2,9], few survivors follow the guidelines on exercise in oncology. Many are not physically active [11]. Although physical exercise, during and after cancer treatment, should be recommended to all patients [12], this does not happen and not all clinicians prescribe physical activity to patients, either during or after chemotherapy [13], submitted for publication. Frequently, oncologists do not discuss on integrative treatments with cancer patients for lack of knowledge or prejudice, others because they feel uncertain about the safety, but all of them for lack of time (unpublished data). Professionals who work with cancer patients must be trained/informed on how to systematically ask for information on the physical activities practiced, with what frequency, duration and satisfaction, together with the measurement of vital parameters. And then, they all need to be trained about how best to help cancer patients become physically active.

Furthermore, in association with and after specific rehabilitation programs in oncology, traditional exercises such as Pilates, Yoga, Qigong, Taiqi appear to be very useful, which by promoting the integrated movement of the whole body, lead to an improvement in strength, posture and coordination. and secondarily of Quality of Life.

A regular exercise can help prevent cancer as well as help people undergoing cancer treatment. Of course, an exercise regimen should be tailored to fit each cancer patient's preference and functional status. To prescribe a safe and effective exercise program, the patient's age, type and stage of cancer, treatment side effects, and other health considerations should be evaluated first.

The experts recommend 30 minutes of aerobic exercise 3 times a week and strength training 2 to 3 times a week. Physical exercise can help prevent cancer by reducing inflammation, keeping weight under control, and boosting the immune system.

In future studies physical activity type, frequency and intensity need to be assessed. In the future all the clinicians that work with cancer patients must be connected in a network of specialists who know how to propose integrative oncological treatments suitable for each individual patient and supervise the outcomes.

As suggested by experts around the world, we like to repeat:

- Regular exercise can help prevent cancer as well as help people undergoing cancer treatment.
- 30 minutes of aerobic exercise 3 times a week and strength training 2 to 3 times a week are recommended.
- Physical exercise reduces inflammation, keeps weight under control, and boosts the immune system.

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