

Determinants of adherence to physical activity guidelines among overweight and obese

African American breast cancer survivors: Implications for an intervention approach

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ABSTRACT

Objective: Public health agencies encourage breast cancer survivors to follow their physical activity guidelines (PAGs). However, adherence to these guidelines is low. African American breast cancer survivors are more often overweight or obese and are less likely than women of other races to report adherence to physical activity recommendations. The present study examined socioeconomic, clinical, and psychosocial correlates with physical activity levels. Methods: African American women (n=157) diagnosed and treated for breast cancer and participating in a breast cancer support group completed a lifestyle assessment tool capturing demographic characteristics; breast cancer diagnosis and treatment history; health-related quality of life; weight history, including body mass index and post-diagnosis weight gain; and physical activity. Logistic regressions were used to determine if these covariates were associated with meeting >17.5 metabolic equivalent task (MET) hr/wk; partially meeting (8.75-17.5 MET hr/wk); or not meeting (<8.75 MET hr/wk) PAGs. Results: Only 54% of African American breast cancer survivors reported meeting current PAGs. Higher education, higher income, having surgery, receiving chemotherapy, and having hormonal treatments were correlates of adherence to PAGs. Being overweight or obese (62%) and weight gain of >6 lbs post-diagnosis were associated with partially meeting or not meeting PAGs. Participants reporting better physical functioning were more likely to complete at least 17.5 MET hr/wk. Conclusion: Various factors influence physical activity behaviors and are likely to be relevant in developing effective interventions to assist African American survivors in managing their weight. Providers and breast cancer support groups that assist survivors to remain physically active and to manage their weight should be aware of these factors. These findings may help generate hypotheses for future research to increase physical activity among African American breast cancer survivors. GRANT SUPPORT: National Institute on Minority Health and Health Disparities (1P20MD006881) and the National Cancer Institute (1R01CA166785).

INTRODUCTION

The Department of Health & Human Services (DHHS) 2008 Physical Activity Guidelines (PAGs) serve as a benchmark for science-based recommendations on exercise. For adults, at least 150 min/wk of moderate-intensity or 75 min/wk of vigorous-intensity aerobic physical activity (PA) is advised.

According to the American Cancer Society (ACS) and the American Institute for Cancer Research (AICR), about one-third of the most common cancers in the US could be prevented and the risk of cancer recurrence could be reduced by a healthy lifestyle, including being physically active.

Among breast cancer survivors (BCSs), PA improves physical functioning, cardiovascular fitness, emotional well-being, and psychological adjustment; lowers fatigue, depression and anxiety; and helps maintain a healthy body weight.

Levels of PA are low among BCSs, and African American (AA) women, relative to White women, are less likely to meet PAGs.

Little is known about the barriers that hinder overweight and obese AA BCS from adhering to PAGs. The purposes of this report are to: 1) describe adherence to PAGs among AA BCSs; 2) determine associations between adherence to PAGs and socioeconomic, clinical, and psychosocial covariates; and 3) discuss implications of these associations in developing lifestyle interventions to reduce risk of breast cancer recurrence. The hypothesis was that BCSs meeting or partially meeting PAGs would report less depression, pain interference, and pain intensity and better physical functioning than those not meeting recommended PA levels

METHODS

Study participants: Members of a BC support group, Survivors Involving Supporters to Take Action in Advancing Health (SISTA AH) Talk, in Miami, Florida. The 2011 Behavioral Risk Factor Surveillance System (BRFSS) and the 2009-2010 National Health and Nutrition Examination Survey (NHANES) were used to develop a lifestyle assessment tool (LAT). Following consent, participants (n = 240) who were English-speaking/reading and at least one-year post-treatment, completed the assessment tool through various modes (e.g., self-administered on-line or mailed version or facilitator-administered in-person or by telephone interview). Participants completed the LAT relating to weight and BC history, dietary intake, and physical activity.

Measures: Socio-demographic variables were age, education, income, and marital status. BC diagnosis and treatment history was captured as year of diagnosis, stage at diagnosis, hormone receptor status, type of treatment received, and history of recurrence. Body-mass index (BMI) was calculated using height and weight information. Health-related quality of life (HR-QoL) was measured through the Patient Reported Outcomes Measurement Information System (PROMIS). The primary outcome was PA, based on meeting the DHHS 2008 recommendation of >150 min total PA/wk as sufficient and >0 min but <150 min per week as insufficient. Reported PA was used to calculate total weekly metabolic equivalent task (MET)-hr/wk. MET values were multiplied by the number of hours per week reported for each activity type and summed across amounts captured by: 1) estimating age-gender specific maximum oxygen uptake to create an indicator for intensity of the first and second activities; and 2) counting the number of physical activities or exercises for muscle strengthening per week. PA levels closest to PAGs were scored highest (n=2), and those least consistent with the guidelines scored lowest (n=0). The PAG of 30 min of moderate activity (~3.5 METs) 5 days/wk is equivalent to 17.5 MET hr/wk, which was assigned a score of 2 (meeting); 8.75-17.5 MET hr/wk was assigned a score of 1 (partially meeting); and <8.75 MET hr/wk was assigned a score of 0, or not meeting.

Statistical analysis: Adherence to PAGs was reported using frequencies and proportions based on the 2011 Physical Activity Rotating Core. Means and standard deviations were used for continuous data as well as frequencies (proportions) for all categorical data; chi-square tests and t-tests were used to identify associations between adherence to PAGs and socio-demographic factors, BMI, and HR-QoL. An ordered logistic model with a cumulative logit link function was performed to examine the association between adherence to PAGs and related determinants of adherence to PAGs. Adjusted odds ratios and related 95% confidence intervals were derived from multivariate analyses.

RESULTS

Table 1. Physical activity by demographics, diagnosis history, and treatment type

Variable	Total n (%)	PAGs ¹ Mean (%)			p-value*
		Meet n (%)	Partially Meet n (%)	Not Meet n(%)	
Age, years					0.3203
<50	44 (28.03)	22 (26.19)	2 (20.00)	20 (31.75)	
50-64	81 (51.59)	40 (47.62)	7 (70.00)	34 (53.97)	
≥ 65	32 (20.38)	22 (26.19)	1 (10.00)	9 (14.29)	
Education					0.0228
Less than college	35 (22.29)	13 (15.48)	1 (10.00)	21 (33.33)	
College or greater	122 (77.71)	71 (84.52)	9 (90.00)	42 (66.67)	
Employment					0.1455
Employed	73 (46.79)	34 (40.48)	4 (40.00)	35 (56.45)	
Not employed	83 (53.21)	50 (59.52)	6 (60.00)	27 (43.55)	
Income, annual					0.0459
<\$25,000	45 (28.85)	23 (27.38)	4 (40.00)	18 (29.03)	
\$25,000-\$49,999	59 (37.82)	25 (29.76)	3 (30.00)	31 (50.00)	
≥\$50,000	52 (33.33)	36 (42.86)	3 (30.00)	13 (20.97)	
Marital Status					0.0420
Single	37 (23.72)	15 (18.07)	6 (60.00)	16 (25.40)	
Married	60 (38.46)	37 (44.58)	2 (20.00)	21 (33.33)	
Divorced/Widowed	59 (37.82)	31 (37.35)	2 (20.00)	26 (41.27)	
Year Since Diagnosis					0.3232
<1	16 (10.39)	9 (10.84)	0 (0.00)	7 (11.48)	
1-5	66 (42.86)	37 (44.58)	7 (70.00)	22 (36.07)	
≥5	72 (46.75)	37 (44.58)	3 (30.00)	32 (52.46)	
Stage at Diagnosis					0.2516
I	65 (41.94)	42 (50.00)	4 (44.44)	19 (30.65)	
II	41 (26.45)	20 (23.81)	3 (33.33)	18 (29.03)	
II & III	33 (21.29)	13 (15.48)	2 (22.22)	18 (29.03)	
Don't Know	16 (10.32)	9 (10.71)	0 (0.00)	7 (11.29)	
Hormone Status					0.5132
Estrogen ³	45 (46.88)	22 (43.14)	3 (37.50)	20 (54.05)	
Estrogen ⁴⁺	51 (53.13)	29 (56.86)	5 (62.50)	17 (45.95)	
Progesterone ⁻	46 (76.67)	24 (72.73)	4 (80.00)	18 (81.82)	0.7248
Progesterone ⁺	14 (23.33)	9 (27.27)	1 (20.00)	4 (18.18)	
Her2/Neu-	48 (80.00)	26 (81.25)	3 (60.00)	19 (82.61)	0.5018
Her2/Neu+	12 (20.00)	6 (18.75)	2 (40.00)	4 (17.39)	
Recurrence					0.6589
Yes	30 (19.23)	14 (16.67)	2 (20.00)	14 (22.58)	
No	125 (80.13)	70 (83.33)	8 (80.00)	47 (75.81)	
Surgery					0.0170
Yes	141 (89.81)	80 (95.24)	7 (70.00)	54 (85.71)	
No	16 (10.19)	4 (4.76)	3 (30.00)	9 (14.29)	
Chemotherapy					0.0411
Yes	88 (56.05)	40 (47.62)	5 (50.00)	43 (68.25)	
No	69 (43.95)	44 (52.38)	5 (50.00)	20 (31.75)	
Hormone Treatments					0.0158
Yes	50 (31.85)	31 (36.90)	6 (60.00)	13 (20.63)	
No	107 (68.15)	53 (63.10)	4 (40.00)	50 (79.37)	
Bone marrow/Stem cell transplant					0.2206
Yes	2 (1.27)	0 (0.00)	0 (0.00)	2 (3.17)	
No	155 (98.73)	84 (100.00)	10 (100.00)	61 (96.83)	

¹PAGs, physical activity guidelines (meet [17.5 MET h/wk]=2; partially meet [8.75-17.5 MET h/wk]=1; not meet [<8.75 MET h/wk]=0); ²III+, stage IIIb, IV; ³-, negative; ⁴+, positive; *p<0.05 is significant

Table 2. Physical activity by body mass index (BMI)

Variable	Total n (%)	Meet n (%)	Partially Meet n (%)	Not Meet n(%)	p-value*
BMI, kg/m²					0.3493
Healthy weight, >25	60 (38.22)	34 (40.48)	3 (30.00)	23 (36.51)	
Overweight, 25-29.99	51 (32.48)	24 (28.57)	6 (60.00)	21 (33.33)	
Obese, ≥30	46 (29.30)	26 (30.95)	1 (10.00)	19 (30.16)	
Post-diagnosis weight gain, lbs					0.0018
≤5	76 (48.41)	52 (61.90)	2 (20.00)	22 (34.92)	
6-10	6 (3.82)	3 (3.57)	1 (10.00)	2 (3.17)	
>10	75 (47.77)	29 (34.52)	7 (70.00)	39 (61.90)	

¹PAGs, physical activity guidelines (meet [17.5 MET h/wk]=2; partially meet [8.75-17.5 MET h/wk]=1; not meet [<8.75 MET h/wk]=0); *p<0.05 is significant

RESULTS

Table 3. Physical activity and health-related quality of life

Variable	Total n (%)	Mean T-score (SD)	PAGs ¹ Mean (%)			p-value*
			Meet n (%)	Partially Meet n (%)	Not Meet n (%)	
Physical Functioning		28.30 (6.30)				
Do household chores	157 (100.00)		84 (53.50)	10 (6.37)	63 (40.13)	0.0082
Go up and down the stairs	157 (100.00)		84 (53.50)	10 (6.37)	63 (40.13)	0.0142
Go for a walk for at least 15 min	156 (100.00)		83 (53.21)	10 (6.41)	63 (40.38)	0.0423
Fatigue	156 (100.00)	49.40 (10.68)	84 (53.85)	10 (6.41)	62 (39.74)	0.2106
Depression	156 (100.00)	47.69 (8.66)	83 (53.21)	10 (6.41)	63 (40.38)	0.1100
Pain interference	157 (100.00)	51.66 (10.32)	84 (53.50)	10 (6.37)	63 (40.13)	0.1102

¹PAGs, physical activity guidelines (meet [17.5 MET h/wk]=2; partially meet [8.75-17.5 MET h/wk]=1; not meet [<8.75 MET h/wk]=0); *p<0.05 is significant

Table 4. Cumulative logit model of determinants associated adherence to PAGs¹

Variable	Categories	Adjusted ordered logit model			
		Coefficients	OR	95% CI for ORs	p-value*
AGE	<50	-0.9740	0.0378	0.091-1.572	0.1808
	50 – 64	-0.8258	0.438	0.124-1.546	0.1994
EDUCATION	College or greater	1.1796	3.253	1.039-10.188	0.0428
INCOME	\$25,000-\$49,999	-1.3992	0.247	0.081-0.756	0.0143
	≥\$50,000	-0.5474	0.578	0.159-2.111	0.4072
MARITAL STATUS	Married	1.0238	2.784	0.865-8.959	0.0860
	Divorced/Widowed	-0.0615	0.940	0.302-2.933	0.9156
STAGE AT DIAGNOSIS	II	-0.9262	0.396	0.111-1.414	0.1537
	III & IV	-1.3396	0.262	0.060-1.135	0.0734
POST-DIAGNOSIS	6-10	-1.8786	0.153	0.020-1.182	0.0719
WEIGHT GAIN, lbs	>10	-1.0277	0.358	0.153-0.836	0.0176
SURGERY	Yes	1.6171	5.038	1.266-20.046	0.0217
CHEMOTHERAPY	Yes	-0.1340	0.875	0.255-3.002	0.8313
HORMONE TREATMENT	Yes	0.9433	2.568	1.057-6.244	0.0374
PHYSICAL FUNCTIONING	Do household chores	-0.0328	0.968	0.646-1.450	0.8736
	Up & down the stairs	0.2142	1.239	0.597-2.569	0.5649
	Go for a walk 15 min	-0.6670	0.513	0.240-1.099	0.0860

¹PAGs: Physical Activity Guidelines; OR: Odds ratio; CI: Confidence interval; *p<0.05 is significant

DISCUSSION/CONCLUSIONS

Of 240 BCSs completing the LAT, 83 were excluded for failure to complete the PA scale; the overall response rate was 65.4%.

The final study population was 157, with a mean age of 55.6 years (SD= 12.8). Most (77.7%) reported college or higher education, and 38.5% were married. The largest income group (37.8%) earned \$25,000-\$49,999 annually.

Many participants had been diagnosed with breast cancer for five years or more (46.8%), had stage I cancer (41.9%), had surgery (89.8%), and had received chemotherapy (56.1%).

More than half (n=84 (53.5%)) reported meeting the recommended PAGs of 17.5 MET hr/wk. Correlates of meeting the PAGs included: college or higher education (84.5%; p=0.023), annual income of ≥\$50,000 (42.9%; p= 0.046), surgery (95.2%; p=0.017), no chemotherapy (52.4%; p=0.041), and no hormone treatment (63.1%; p=0.016).

Weight gain after BC diagnosis was inversely associated with meeting the PAGs; 61.9% of participants who gained <5 lbs after diagnosis met the PAGs, compared to 38.1% who gained 6 lbs or more (p=0.002). Most survivors (51.6%) reported gaining 6 lbs or more.

The reported ability to perform household chores (p= 0.008), go up and down stairs (p=0.014), and walk for at least 15 min (p=0.042) were associated with meeting the PAGs.

The results of this study may help guide efforts by breast cancer support groups to identify at-risk AA BCSs who may benefit from programs on physical activity and weight management.

These findings may also generate hypotheses for future research to undergird efforts to increase PA among AA BCSs.