WALKING, BODY COMPOSITION, AND BLOOD PRESSURE DOSE-RESPONSE IN AFRICAN AMERICAN AND WHITE WOMEN

L. Jerome Brandon, PhD; Mary Beth Elliott-Lloyd, PhD

Purpose: The purpose of this study was to evaluate body composition and blood pressure (BP) responses to a 16-week dose of brisk walking in sedentary and obese African American (AA) and White women.

Methods: Seventy-five sedentary women (45 AA and 30 White) between the ages of 18 and 50 years and body fat ≥27% signed institutional approved informed consent forms and volunteered to participate in this study. The participants were divided into four groups (AA exercisers [AAE], AA control [AAC], White exercisers [WE], White controls [WC]). The exercisers walked three miles a day, three days a week. Body composition and BP were measured before and after the training intervention. Food records were collected before, during, and after the intervention.

Results: Following training, only the WE experienced a reduction in body weight and body fat ($P<.05$). However, the energy intake of the AAE increased 4.7% during and 16% at the conclusion of the intervention and contributed to them neither losing nor gaining weight or fat. Both exercise groups experienced reductions ($P<.05$) in systolic (AAE 5.7 mm Hg, WE 11.3 mm Hg) and diastolic BPs (AAE 3.0 mm Hg, WE 3.6 mm Hg) following training, but the reductions for the WE were greater ($P<.05$) than for the AAE. There were no changes in body composition or BP for either AAC or WC.

Conclusions: These results indicate that a 16-week walking intervention provides body composition and BP benefits for both AA and White women, but the benefits are greater for White women. (*Ethn Dis*. 2006;16:675–681)

Key Words: Active Lifestyle, Dose-Response, Energy Expenditure, Weight Management

From the Department of Kinesiology and Health, Georgia State University, Atlanta, Georgia.

Address correspondence and reprint requests to L. Jerome Brandon, PhD; Department of Kinesiology and Health; P.O. Box 3975; Georgia State University; Atlanta, GA 30303; 404-651-1120; 404-651-4814; lbrandon@gsu.edu

INTRODUCTION

Obesity and hypertension are public health problems in the United States, particularly among African American (AA) women, ≈50% of whom are obese.[1] Obesity, an excess deposit of stored adipose tissue, has been increasing in recent decades. Body fat deposits are the results of people consuming more energy than they use, which can be caused by a number of factors, including low resting energy expenditure, consuming a large number of calories, or a lack of physical activity.[2–5] Resting energy expenditure (REE) strongly influences obesity when caloric consumption during most hours of the day is at or near the REE and results in an individual's use of minimal energy. Since physical activity helps to increase the metabolic rates of lean body tissues, obese individuals would greatly benefit from physical activity.[2]

Race and perhaps culture may also significantly influence REE. Several studies have documented a difference in REE by race, particularly in AA women who have lower metabolic rates than White women.[2,3,6] Obese AA women typically do not consume more calories than White women but have lower relative REE and burn fewer calories during the day as they participate minimally in leisure physical activity.[2,3,7] The lower REE in AA women is thought to be related to a lower aerobic fitness and bone weight, and not just total body weight.[8–10]

An estimated 43 million to 58.5 million or more Americans are hypertensive, and AAs have the highest prevalence (32%).[11–14] Hypertension, defined as systolic blood pressure (SBP) ≥140 mm Hg or diastolic blood pressure (DBP) ≥90 mm Hg, is a metabolic syndrome disease and a co-morbidity with a number of other diseases. It places individuals at increased risk of cardiovascular disease, and this risk is especially relevant for AA adults. Efforts to educate about hypertension do not appear to be producing the desired results as the percentage of individuals reporting hypertension increased from 22.1% in 1991 to 24.9% of the population in 1999.[15] More than one billion people throughout the world are hypertensive, and ≈7.1 million people die each year from the disease.[11] The large number of deaths related to hypertension is unfortunate, since hypertension is controllable.[16]

One of the National Institutes of Health's goals for treating obesity and hypertension is to prevent illness and death related to these diseases by encouraging lifestyle adjustments, such as improving diet and increasing physical activity.[4,17] Endurance exercise reduces blood pressure by 5–7 mm Hg after an isolated exercise session. Possible mechanisms for the reduction include neurohumoral, vascular, and structural adaptation. Decreases in catecholamines and total peripheral resistance improve insulin sensitivity, and alterations in vasodilators and vasoconstrictors are some of the possible antihypertensive effects of exercise.[14]

A study that evaluated the chronic effects of exercise reported that women who walked 3 km/day experienced an SBP reduction of 6 mm Hg at 12 weeks and a further reduction of 5 mm Hg at 24 weeks. Since the women were predominantly White,[18] we cannot say how AA women may respond to a walking program. Therefore, the purpose of this study was to examine the effects of a 16-week program of brisk walking on body composition and

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blood pressure in sedentary, obese AA and White women. The hypothesis examined in this study was that a 16-week program of brisk walking would result in a similar response of reduced body fat and blood pressure in AA and White women.

METHODS

Participants

Seventy-five sedentary women (45 AA and 30 White) were recruited by advertisement from the student body, staff, and faculty of an urban university and from local government agencies. All women accepted into the study had to meet the criteria for sedentary (exercise less than twice a week for the past six months), weight stability (<5-lb fluctuation in the past six months), age (18–50 years), and body fat (>27% body fat). The women were randomly assigned based on race to either an exercise group or a control group. Women in the exercise group had to be able to successfully walk three miles per session after the first two weeks of orientation. Therefore, participants who met the inclusion criteria and agreed to accept group assignments were 15 African American exercisers (AAE), 13 White exercisers (WE), 12 African American controls (AAC), and 12 White controls (WC). All AAE and WE completed the training intervention. Based on statistical power from another study that evaluated the effects of daily walking on blood pressure in women, an *N* of 12 provided for a statistical power of .81 with a sensitivity less than one standard deviation.[18]

Exclusion criteria included past history of cardiovascular disease, present signs or symptoms of cardiovascular disease, resting SBP >160 mm Hg and resting DBP >100 mm Hg, or taking blood pressure or other medication that contraindicated exercise. Participants with two or more coronary heart disease risk factors (ie, obesity, sedentary lifestyle, and family history were the most frequent) obtained physician approval before participating in the study. Women who were on or had been on diets or weight loss medications affecting body weight within the last six months were excluded from the study. All subjects completed medical and exercise history questionnaires and signed institutional review board approved informed consent forms before beginning the study. All participants were instructed neither to change their present lifestyle nor to change their dietary intake. Members of the intervention groups were asked not to exercise outside of the walking intervention program. Adherence to these requests was monitored by participants' self-report.

Exercise Intervention and Design

The walking intervention required the participants to meet three days a week for 18 weeks. The first two weeks were used for conditioning and instruction on brisk walking. During this two-week training session, all participants developed the ability to walk three miles in a single session. The last 16 weeks constituted the training intervention in which the participants completed a brisk three-mile walk each session. The length of the training intervention for this study was based on the fact that 16 weeks has been shown to be of sufficient length to provide for significant weight loss.[19] The walking groups were monitored to ensure safety, and daily attendance was recorded. Walking was chosen as the exercise mode because it is simple, cost-effective, does not require athletic ability, and can be incorporated easily into the lifestyle of most individuals. Exercise intensity was self-paced, although subjects were encouraged to walk as briskly as possible. The goal was to walk at a 3.5-mph pace. The time necessary to complete the three-mile walk and a self-report of the exercise intensity was recorded each session. The walking sessions took place outside on courses measured for distances before the study by a calibrated measuring wheel. On rainy days, subjects walked on an indoor track or treadmill. Subjects were instructed to make up and record missed walks within a week.

Assessments

Before and after the training intervention, each subject performed a submaximal treadmill test using a modified Balke protocol.[20] Subjects walked until they reached 85% of their predicted heart rate reserve. End-stage heart rates, rating of perceived exertions (RPEs), and blood pressures were recorded. Maximal oxygen consumption was predicted from heart rates and submaximal oxygen uptake by using regression equations.

Baseline and post-training resting blood pressures were measured in triplicate in a seated position as recommended by the American Heart Association.[17] All blood pressure values were measured with a calibrated sphygmomanometer and stethoscope on the right arm. The same technician and equipment were used for all blood pressure measurements in this study.

All body composition measurements were collected before and after the 16-week intervention. Height and weight were measured with standard equipment and were used to calculate body mass index (BMI). Waist and hip circumferences were measured to de-

Table 1. Physical, morphologic, and circulatory baseline characteristics of the participants

Variable	African American Exercisers (n=15)	African American Controls (n=12)	White Exercisers (n=13)	White Controls (n=12)
Age (years)	34.0[a] ± 7.2	36.0 ± 8.4[a]	40.5[b] ± 7.1	42.0 ± 9.7[b]
Weight (kg)	90.9 ± 22.5[a]	83.1 ± 15.5[b]	80.2 ± 9.0[b]	85.7 ± 23.7[b]
Height (cm)	162.5[a] ± 6.0	158.6[a] ± 8.0	164.8[a] ± 7.0	161.7[a] ± 8.0
WHR (cm)	.82[a] ± .06	.82[a] ± .09	.75[b] ± .06	.81[a] ± .1
VO_{2max} (mL/kg/min)	31.4[a] ± 5.2	30.8[a] ± 4.5	32.3[a] ± 6.0	32.3[a] ± 6.0
Body fat % (DEXA)	45.9[a] ± 7.8	43.6[a] ± 6.6	44.1[a] ± 6.1	45.5[a] ± 8.1
Body fat % (skinfolds)	40.9[a] ± 6.2	40.5[a] ± 5.6	36.0[b] ± 5.2	37.2[b] ± 6.4
BMI (kg/m^2)	34.4[a] ± 8.2	33.0[a] ± 7.1	29.5[a] ± 5.7	32.8[a] ± 7.3
SBP (mm Hg)	110.0[a] ± 11.9	103.9[a] ± 15.6	111.0[a] ± 14.9	115.0[a] ± 18.1
DBP (mm Hg)	69.7[a] ± 8.9	63.8[b] ± 14.6	67.0[a] ± 10.3	68.5[a] ± 10.2

Data are means and standard deviations.
Means with the same letter are not different at $P<.05$.

termine central body adipometry. Waist circumference was measured midway between the umbilicus and the xyphoid process with a calibrated tension tape. Hip circumference was measured at the widest hip girth with the heels together. These values were then used to compute waist-hip ratios. Upper body or androidal obesity was defined as a waist-hip ratio ≥.82.[21]

Percent body fat and bone mineral density (BMD) were measured with a Lunar DPX-L dual-energy x-ray absorptiometer (DXA) (model DPX-L with version 3.6R software, Lunar Radiation Corp., Madison, Wis, USA). The DXA measures bone mineral content and has the ability to estimate body fat and non-bone lean mass components regionally (ie, trunk, legs). The DXA uses a three-compartment model (bone, fat, and lean soft tissue) and makes the assumption that the hydration of the mineral-free lean tissue is constant at 0.73 mL/g. The DXA can give regional and whole-body estimates of bone, fat, and lean tissue by measuring the attenuation of two energies of x-rays through the body. The amount of absorbed energy from the x-ray source is directly proportional to bone mineral density. The DXA performs a series of transverse scans moving from head to toe at 1-cm intervals. The DXA scanners are reported to accurately estimate soft tissue composition with a precision of 1% to 1.5%.[22,23]

Seven skinfold sites were measured to the nearest .5 mm with Lange skinfold calipers. Standardized techniques were established, and all measurements were taken on the subject's right side, in rotational order, and by the same investigator. Body density (BD) was calculated by a quadratic equation with the sum of seven skinfold sites (chest, axilla, triceps, subscapular, abdominal, suprailium, and thigh).[24] Total percentage body fat was calculated from BD by using the equation (503.3/BD-459.2) for the White women.[24] Total percentage body fat for the African American women was calculated by using the equation (483.2/BD-436.9).[25,26]

Dietary intake was assessed by using a two-day food record. Participants recorded their dietary intake on a Sunday and Monday three times during the study (weeks 1, 9, and 16). Nutritional computer software (NCA, Nourish Check Athlete, USDA database) was used to analyze the food data for total caloric intake, carbohydrate grams, protein grams, and fat grams. The purpose of food records during the study was to monitor the status of energy intake during the 16-week intervention.

Statistical Analysis

The data were analyzed with SPSS (SPSS Inc., Chicago, Ill). Means and standard deviations were calculated for all of the data by using descriptive statistics. A repeated measures 2×2 analysis of variance (race by group) was used to evaluate the data for differences. Main effects and interaction effects were used to determine the nature of the differences for the variables. Only subjects that completed 75% of the training intervention were included in the data analyses. Twelve AAE and four WE who began the training intervention were not included in the final analyses.

RESULTS

The AAE were younger, heavier, and based on the WHR, had a larger central fat deposit ($P<.05$) than the WE. Within-group physical characteristics were not different for either group, except the AAE were heavier than the AAC (Table 1). Although the AAE were heavier than the other groups, their BMI or body mass per unit of height was not different ($P>.05$) from the other groups. The baseline fitness levels of the different groups, based on predicted maximal oxygen consumption (VO_{2max}) were not different ($P>.05$).

All groups were classified as obese based on DXA body fat, skinfold body fat, and BMI assessments, except for the WE based on BMI (Table 1). Body fat measured by DXA was not different within or between races, but skinfold body fat assessments indicate that the

Table 2. Exercise adherence during 16 weeks of walking training

Exercise Group	African American n=15	White n=13	Total N=28
Adherence rate (%)	86.0 ± 9.5	90.0 ± 7.8	87.6 ± 8.9
Drop out (%)	55.0*	26.0*	45.0
Exercise pace (mph)	3.54 ± .2	3.61 ± .2	3.57 ± .2
Exercise time (min)	50.8 ± 5.5	49.8 ± 3.5	50.4 ± 4.6

Means are different based on race at $P<.05$.
* These percentages are from the original samples as 15 AAE and 13 WE completed the training intervention and their data are those included in the analyses

AA groups were fatter than the White groups. Mean baseline SBP and DBP were not different for any of the four groups, except DBP was lower for the AAC. Mean resting blood pressure was within the normotensive range for all groups.

The AA participants had an 86% and the White participants had a 90% exercise adherence during the walking intervention, and the retention rate was better for the White group (Table 2). The average walking pace of 3.57 miles per hour (3.54 mph for the AAE and 3.61 mph for the WE) for all exercisers indicates that the walk was brisk and that the walking pace was the same between races.

During the walking intervention the White exercisers experienced a loss ($P<.05$) in body weight, losing an average of 3.4 kg (6.9 pounds), which was ≈4.2% of their mean baseline body weight. The walking intervention did not result in weight loss for the AAE (Table 3). However, the energy intake of the AAE increased 16% from 1586 ± 151 kcal at baseline to 1839 ± 120 kcal ($P<.05$) at week 16 of the walking intervention (Table 4). The energy intake of the WE decreased by 12.7% at week 9 and was still down by 5.1% at week 16. The differences in energy intake appear to be at least partially responsible for the differences observed for weight loss between the AAE and the WE. These results suggest that both groups would have lost weight had the energy intake of the AAE not increased. Both the AAC and WC groups experienced statistically significant increases in body weight during the 16-week intervention.

Based on DXA analyses, a significant decrease in total percentage body fat was observed for the WE (from 44.1% to 41.1%, $P<.05$), but not for the AAE (45.9–45.2). These data indicate that for White females walking three miles a day at 3.6 mph, a 6.8% reduction in body fat resulted when caloric intake

Table 3. Morphologic responses after 16 weeks of walking training

Variables	Group	Pre-Test	Post-Test	Diff	P values
Weight (kg)	AAE	90.9 ± 22.5	90.5 ± 22.5	−.4	.543
	AAC	83.1 ± 15.5	85.5 ± 15.3	2.4	.011*
	WE	80.2 ± 19.2	76.8 ± 19.3	−3.4	.001*
	WC	85.7 ± 23.7	88.4 ± 24.1	2.7	.003*
Body fat (%) DXA	AAE	45.9 ± 7.8	45.2 ± 7.7	−.72	.164
	AAC	43.6 ± 6.6	44.3 ± 5.9	.65	.311
	WE	44.1 ± 6.1	41.1 ± 5.6	−3.00	.001*
	WC	45.4 ± 8.1	45.9 ± 8.0	.57	.110
Trunk fat (%) DXA	AAE	46.2 ± 7.5	44.5 ± 7.0	−1.71	.024*
	AAC	44.6 ± 7.0	45.6 ± 6.4	1.02	.338
	WE	43.8 ± 6.0	41.9 ± 5.6	−1.94	.001*
	WC	45.6 ± 9.0	45.5 ± 8.5	−.01	.891
Leg fat (%) DXA	AAE	48.3 ± 7.9	48.5 ± 7.0	.173	.807
	AAC	45.4 ± 5.9	45.7 ± 5.2	.292	.663
	WE	47.3 ± 6.4	46.4 ± 6.2	−.890	.010
	WC	48.4 ± 6.3	48.6 ± 5.9	.183	.674
BMI (kg/m^2)	AAE	34.4 ± 8.2	34.2 ± 8.4	−.03	.214
	AAC	33.0 ± 7.1	33.3 ± 7.1	.33	.204
	WE	29.5 ± 5.7	28.3 ± 5.8	−1.15	.001*
	WC	32.8 ± 7.3	33.4 ± 7.6	.63	.002*
WHR (cm-%)	AAE	.82 ± .06	.81 ± .05	−.01	.138
	AAC	.82 ± .09	.82 ± .09	.00	.504
	WE	.76 ± .06	.74 ± .06	−.02	.000*
	WC	.81 ± .06	.81 ± .06	.00	.082

Data are means and standard deviations.
AAE=African American exercisers; AAC=African American control; WE=White exercisers; WC=White control.
* Means different at $P<.05$.

Table 4. Energy consumption before, during, and after the 16-week walking intervention

	African American Exercisers $n=15$			White Exercisers $n=13$		
	Baseline	During-Training	Post-Training	Baseline	During-Training	Post-Training
Nutrient	$\bar{X}$ ± S	$\bar{X}$ ± S	$\bar{X}$ ± S	$\bar{X}$ ± S	$\bar{X}$ ± S	$\bar{X}$ ± S
Total energy(kcal)	1586 ± 151	1661 ± 148	1830 ± 120*	1693 ± 158	1478 ± 155*	1606 ± 126
Fat (g)	60 ± 7.1	60 ± 6.3	64 ± 6.1	58 ± 7.4	49 ± 6.5	59 ± 6.4
Carbohydrate (g)	201 ± 22	224 ± 24*	243 ± 19*	230 ± 23	196 ± 26*	209 ± 21
Protein (g)	63 ± 5.9	62 ± 6.0	74 ± 5.7	65 ± 6.2	63 ± 6.3	62 ± 6.0

* Within race mean is different than baseline at $P<.05$.
$\bar{X}$ = mean; S = standard deviation.

was reduced between 5.1% and 12.7% during the walking intervention. For AAE, a 1.5% reduction in percent body fat was observed with an increase of 4.7% to 16% in energy intake during the training. Neither of the control groups experienced a decrease in body fat during the training intervention.

The walk intervention resulted in a significant ($P<.05$) improvement in the predicted VO_{2max} (mL/kg/min) for both the AAE and the WE. The WE improved 15.5% while the AAE improved 11.5%. No improvements were seen in either of the control groups.

The walking intervention produced lower resting SBP and DBP in both the AAE and WE groups (Table 5). The AAE resting SBP decreased an average of 5.7 mm Hg (from 110.2 ± 11.9 to 104.5 ± 13.9 mm Hg, $P<.01$) while the resting SBP of the WE decreased an average of 11.3 mm Hg (from 111.3 ± 14.9 to 100.0 ± 13.7 mm Hg, $P<.001$). All exercisers experienced statistically significant decreases in resting DBP (AAE −3.0 mm Hg; WE −3.6 mm Hg, $P<.01$ for both). Both groups' mean decreases in resting SBP were clinically significant (≥5 mm Hg). Neither exercise group experienced a clinically significant decrease in resting DBP. Resting SBP and DBP of the control groups remained unchanged during the training intervention.

DISCUSSION

Our hypothesis, that a 16-week dose of brisk walking would produce a response resulting in a similar reduction in body fat and blood pressure for AA and White women, was not supported. The WE experienced a significant drop of 3% in body fat, while the AAE dropped only .7% fat. This difference may be partially explained by the energy consumption of the two groups in this study during the walking intervention. Initially, the energy consumption of the AAE and WE was not different, but post-training energy consumption revealed that the AAE were consuming 16.0% more energy than at baseline and 13.9% more than the WE. This increase amounted to 244 kcal/day or 1708 kcal/week. The increase in energy consumption apparently partially prevented AAE from losing weight during the walk intervention.[2,27] Another factor that may help explain why the AA women did not lose weight is REE;

Table 5. Circulatory and metabolic responses after 16 weeks of walking training

Variable	Group	Pre-Test	Post-Test	Diff.	*P* values
SBP (mm Hg)	AAE	110.2 ± 11.9	104.5 ± 13.9	−5.7	.001*
	AAC	104.3 ± 15.6	105.3 ± 15.4	1.0	.146
	WE	111.4 ± 14.9	100.1 ± 13.7	−11.3	.000*
	WC	115.2 ± 18.1	116.2 ± 18.7	1.0	.544
DBP (mm Hg)	AAE	69.7 ± 8.9	66.7 ± 9.9	−3.0	.001*
	AAC	63.8 ± 14.6	64.8 ± 13.8	1.0	.204
	WE	67.1 ± 10.3	63.5 ± 9.2	−3.6	.001*
	WC	68.4 ± 10.2	68.5 ± 9.9	−.1	.847
VO_{2max} (mL/kg/min)	AAE	31.4 ± 5.2	35.0 ± 4.3	3.6	.000*
	AAC	30.8 ± 4.5	30.4 ± 4.2	−.4	.275
	WE	33.0 ± 6.1	38.1 ± 6.2	5.1	.000*
	WC	32.3 ± 6.0	32.0 ± 5.9	.0	.237

Data are means and standard deviations.
AAE=African American exercisers; AAC=African American control; WE=White Exercisers; WC=White control.
* Means different at $P<.05$.

AA women have lower levels than White women, independent of weight and body fat.[3,9,10]

Similar to results in the present study, other studies have observed similar racial differences in weight loss during interventions. During a 12-week cardiac rehabilitation study, 47 White and 35 AA obese females exercised on treadmills, rowing machines, and cycle ergometers for 30 minutes each session for three days a week. The White women lost more weight than AA women. White women lost an average of four pounds while the AA women's weight did not change, even though the fitness level of both groups improved.[28] Similarly, in The Hypertension Prevention Trial and the Trials of Hypertension Prevention, both of which included nutritional and behavioral interventions, White women lost more weight than the AA women.[29,30] The authors concluded that behavioral and sociocultural issues appeared to contribute to the results.

A major limitation of the existing literature, when determining the impact of weight loss procedures, is that most studies examined either nutrition or physical activity, whereas few comprehensively examined both.[31] The need to examine both is made clear in the present study, as nutritional issues appeared to have restricted the impact of physical activity on weight loss for the AAE. This finding is consistent with the recommendation made previously that behavior is a consideration when AA women are attempting to lose weight.[30] The behavior that resulted in an increased energy intake during the walking intervention in the present study adds another factor to consider when evaluating the effectiveness of different weight loss procedures for AA women.

The three-mile walking intervention was an exercise program that resulted in decreases in both SBP and DBP responses in both AAE and WE, but larger decreases were observed for the WE. This trend of reductions in blood pressure after aerobic exercise training is consistent with other data in the literature. In a meta-analysis study with 54 randomized, controlled studies that included 2419 participants, aerobic exercise was associated with a significant reduction in mean SBP and DBP (−3.84 mm Hg and −2.58 mm Hg, respectively).[32] Reductions in blood pressure were associated with aerobic exercise in hypertensive and normotensive participants, and in overweight and normal-weight participants.[32]

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The 5.7-mm Hg decrease for SBP and the 3.0-mm Hg decrease for DBP in AAE is similar to some findings in the literature but different from others.[30,33] Similar to findings in the present study, decreases in resting SBP and DBP (5 mm Hg and 3 mm Hg, respectively) were observed in obese AAE after an eight-week weight loss program in one study. Unlike the present study, their intervention included both nutrition counseling and exercise sessions two hours weekly.[33] In another study, the hypotensive effect of walking one hour a day, five days a week, for four weeks was investigated, and the results demonstrated an average decrease in resting SBP and DBP of 5 mm Hg and 3 mm Hg, respectively.[30]

The SBP responses observed for the WE after the walking intervention in the present study are favorable, but the DBP responses are similar to others in the literature.[32,34] The 11.3-mm Hg decrease in SBP are greater than the 8.4-mm Hg decrease and the 3.4-mm Hg decrease, reported in other studies.[32,34] The 3.6-mm Hg decrease for DBP is similar to that reported in the literature.[32,34] The fact that the SBP of the WE was different than ($P<.05$) that of the AAE suggests the possibility of either a greater BP response from walking occurs for White women or that AA women experience a lesser BP response when they do not experience a reduction in body weight and fat following a walking intervention.

CONCLUSION

These data indicate that walking at a pace of 3.57 mph three days a week provides beneficial body composition and BP responses in both AA and White women. The walking dose did not produce a significant body composition response after the intervention for the AA women. However, the walking dose did allow the AAE to maintain weight and percentage of fat even though they were consuming 16% more energy at the conclusion of the training intervention. A reduction in REE may have also contributed to the AA women's not losing weight. The walking dose for the White women resulted in a reduction of body fat. When the energy consumption pattern for the study was analyzed, it suggested that cultural eating patterns may be considerations when establishing weight loss procedures for AA women.

The blood pressure response pattern after the walking intervention was similar for both groups of women in that both experienced a significant reduction in SBP and DBP. The reduction for SBP was physiologically significant as both the AAE and WE experienced $\geq$5-mm Hg reductions, but the SBP reductions for the WE were larger than for the AA women. The groups experienced similar statistically significant reductions in DBP but not physiologically significant reductions. These data indicate that a 3.57 mph walking program provides different blood pressure and body composition responses for AA and White women and that cultural and racial issues related to energy consumption patterns appear to be important when designing programs for AA women.

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AUTHOR CONTRIBUTIONS

Design concept of study: Brandon, Elliott-Lloyd
Acquisition of data: Elliott-Lloyd
Data analysis interpretation: Brandon, Elliott-Lloyd
Manuscript draft: Brandon
Statistical expertise: Brandon, Elliott-Lloyd
Administrative, technical, or material assistance: Brandon
Supervision: Brandon