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Accelerometer measured sedentary behavior and physical activity in white and black adults: the REGARDS study

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Abstract

Objectives—Health disparities between subgroups may be partially due to differences in lifestyle behaviors such as sedentariness and physical activity (PA). To obtain a more accurate description of these two lifestyle behaviors, accelerometry was employed among a large sample of white and black adults (ages 49–99 years) living in the United States.

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Contributors SPH conceived of the study, participated in its design, performed the statistical analysis, interpreted the results, and drafted the manuscript. BH, SNB, NC, and JEV participated in design of the study, interpreted the results, and helped draft the manuscript. DR and VJH participated in the design and coordination of the study, interpreted results, and helped draft the manuscript. WZ performed the statistical analyses, interpreted the results, and helped draft the manuscript. All authors read and approved the final manuscript.

Competing interests None.

Ethics approval This study as approved by the Institutional Review Boards at the University of Alabama at Birmingham, University of South Carolina, University of Georgia, and Arizona State University.

Design—Cross-sectional.

Methods—7,967 participants from the REasons for Geographic and Racial Differences in Stroke cohort wore an Actical™ accelerometer 10 hours/day for 4 days. Time (mean minutes/day and proportion of total wear time) spent in sedentary behavior, light intensity PA (LIPA), and moderate-vigorous intensity PA (MVPA) were compared by sex, age, body mass index (BMI), race, and geographic location.

Results—Proportion of total wear time spent in sedentary behavior was 75-90%, LIPA was 10-23%, and MVPA was 0-1.7% across subgroups. Mean MVPA was 0-16 min/day and associated with 3-12% accumulating 150 min/wk using a 10-minute bout criterion. Persons 85 years, those classified obese, persons living in the southeastern United States, and black women were the most inactive. The proportion achieving at least one 10-minute bout of MVPA per week was only 36%. The number of 10-minute bouts/week was 1.5 ± 0.08 bouts/week. The distribution of weekly MVPA was similar across nearly all subgroups with a distinct reverse J-shaped configuration.

Conclusions—The vast majority of white and black midlife and older adults in this study engaged sparingly in MVPA, accumulated tremendous amounts of sedentary behavior, and seldom engaged in continuous bouts of health-enhancing PA.

Keywords

African American; aging; cohort; exercise; movement sensor; patterns

1. Introduction

Many adults in the United States (U.S.) do not achieve the recommended amount of physical activity (PA) to fully realize health benefits.^{1,2} Adult women, blacks, and persons residing in the Southeast U.S. self-report the lowest levels of PA.^{1,3,4} However, self-reported PA is prone to recall biases, imprecise quantification of intensity, and cultural biases in perceived desirability of PA, which can lead to misclassification of individual and population PA levels.^{5,6} Misclassification of PA may be particularly concerning when using self-report in racial/ethnic minorities for whom subgroup-specific questionnaires have not been developed. In addition, older adults are more likely to engage in light intensity activities that are challenging to accurately capture via self-report.⁷ To help avoid misclassification and other difficulties, objective measures of PA can be employed.

Emerging evidence also reveals the need to measure sedentary behavior as it exerts an effect independent of PA on several health-related outcomes.^{8,9} As with PA, objective measures of sedentary behavior are recommended to supplement self-reported assessments.^{7,10} However, little is known about objectively measured levels of sedentary behavior among subgroups of adults living in the U.S. What has been reported in much smaller samples than the current study suggests older adults are the most sedentary with little difference noted between white and black older adults.^{3,11}

Our aim was to obtain objective measures of sedentary behavior (i.e., activities expending 1.5 METs) and PA in a large sample of white and black midlife and older adults living in

the U.S. It is possible that health disparities between subgroups are partially due to differences in lifestyle behaviors such as sedentariness and PA. Thus, a more accurate description of these two lifestyle behaviors among midlife and older adults is desirable.

2. Methods

The REasons for Geographic and Racial Differences Study (REGARDS) comprises a general population sample in the U.S. with oversampling from the Stroke Belt in the Southeast U.S. (comprising the states of North Carolina, South Carolina, Georgia, Tennessee, Mississippi, Alabama, Louisiana, and Arkansas). REGARDS was designed to prospectively examine racial and regional disparities in stroke risk and mortality with methods described elsewhere.¹² Overall, 30,239 black and white participants, aged 45 years, were recruited from 2003–2007 and screened for eligibility during a phone interview. Following verbal consent, using a computer-assisted telephone interview (CATI), demographic and medical information was obtained. An in-person physical examination including blood pressure, height and weight measures was conducted 3–4 weeks later, and written informed consent obtained.

Objective measures of sedentary behavior and PA were collected from May 2009 - January 2013 for an ancillary study with procedures previously described.¹³ During follow-up CATI calls, prospective participants were asked whether or not on a typical day they were able to go outside their house and walk as an indicator of their functional capacity. Following an affirmative response, the ancillary study was explained and the participant asked if he/she would be willing to wear an accelerometer and complete a log sheet for seven consecutive days. If the participant agreed (i.e., verbal consent provided), the CATI unit notified staff responsible for implementing the accelerometer protocol. Each investigator's Institutional Review Board approved the study methods which, due to previous written consent provided for the REGARDS parent study, required only verbal consent.

Staff initialized an Actical™ accelerometer to collect data in 60-sec epochs, secured it to a nylon belt, and mailed it to the participant with a cover letter, written and visual wear instructions, log sheet, and pre-addressed and postage-paid return envelope. Participants were instructed to start wearing the device the day after they received it, remove at bedtime and reattach upon awakening, position the device snugly over the right hip, complete the log sheet daily, and return the device immediately after completing the protocol.

Participants were asked to complete a log sheet daily with two elements: the date the Actical™ was first worn, and the time(s) put on and taken off each day. A record was excluded for: (1) missing or illegible time(s) or date(s); or (2) self-reported wear dates not corresponding with valid data in the Actical™ file. Other data were excluded due to device failure or errors (e.g. activity counts >20,000 or lengthy strings of repeated counts). Compliant participants wore the device 10 hours/day on at least four days.¹⁴ Nonwear periods were defined as 150 consecutive minutes of 0 activity counts.¹⁵ Activity counts of 0-49 counts per minute (cpm), 50-1064 cpm, and 1065 cpm distinguished sedentary behavior, light intensity PA (LIPA), and moderate or higher intensity PA (MVPA), respectively.¹⁶

Characteristics collected during initial enrollment into the parent REGARDS study included hypertension (SBP ≥ 140 mmHg, DBP ≥ 90 mmHg, or use of antihypertensive medications), diabetes (fasting serum glucose ≥ 126 mg/dL [7.0 mmol/L], non-fasting serum glucose ≥ 200 mg/dL [11.1 mmol/L], or medication use for diabetes), and body mass index (BMI) (using measured height and weight; underweight [<18.5 kg·m²], normal weight [18.5-24.9 kg·m²], overweight [25-29.9 kg·m²] and obese [≥ 30.0 kg·m²]). Age, race, sex, education level, annual household income, and smoking were derived from initial CATI data.

The cohort for this ancillary study has been described previously.¹³ Briefly, 20,076 eligible participants from the original sample of 30,239 were able to be contacted and invited to participate: 12,146 (60.5%) consented, 7,312 (36.4%) declined, and 618 (3.1%) deferred without the opportunity to be recruited again. Accounting for lost, defective or non-worn devices (n=2,173), and excluding those with device errors, missing log sheets, or invalid wear time (n=1,877), usable data was provided by 8,096. Excluding those missing any covariates of interest (n=129) left 7,967 for analyses.

Descriptive analyses included adjusted means ($\pm$ SE) for wear time, nonwear time, sedentary minutes/day, LIPA minutes/day, and MVPA minutes/day. Time spent in a defined intensity (sedentary, light, or MVPA) was determined by summing minutes in a day when the activity count met the criterion for that intensity. To reflect the importance of accumulation, time spent in LIPA or MVPA is presented for every minute meeting the specific criterion. Duration of MVPA occurring in 10-minute bouts was also calculated. A 10-minute bout was defined as 10 consecutive minutes above the MVPA activity count threshold with allowance of 1-2 minutes below threshold.^{2,17} Proportion of wear time spent in sedentary behavior, LIPA, and MVPA was calculated by dividing the sum of time for a given outcome by total wear time.

Overall difference between race/sex and other demographic groups for age, mean valid wear days, and mean total daily wear time was examined by ANOVA with paired Tukey tests. Differences between race/sex for daily mean sedentary time, mean LIPA, and mean MVPA, and number of 10 min bouts/day was explored with linear regression followed by paired Tukey tests. Covariates adjusted for included age, education, BMI, diabetes, hypertension, and smoking. Results were presented as mean $\pm$ standard error (SE). Differences in distributions within and/or across race/sex groups and other demographics, achieving ≥ 150 min/wk of MVPA or not, and with at least one 10-minute bout of MVPA or not were tested by Chi-square. To explore patterns of accumulated weekly MVPA, we included any activity count ≥ 1065 cpm and used categories of <37 , 38-74, 75-112, 113-149 and ≥ 150 min/wk. Significance was set at $P \leq .05$. Analyses were conducted using SAS version 9.3 (SAS Institute, Cary, NC).

3. Results

Table 1 displays demographic and accelerometer compliance characteristics. There was a statistically significant difference among race/sex groups for mean age, valid wear days and daily wear time. The mean age for white men was significantly higher than other race/sex groups who did not vary by age. There were significant differences in the distribution of

proportions within and across race/sex groups for income, education, BMI, diabetes, hypertension, and smoking. White men and women had significantly higher mean valid wear days than black men and women, and black men had significantly higher mean valid wear days than black women. Absolute mean differences for valid wear days (0.1-0.3 days) and daily wear time (10-12 minutes) were negligible, however, with 82-92% of each subgroup wearing the device 6-7 days and nearly 15 hr/day.

Mean amount and proportion of time spent in sedentary behavior and PA of varying intensity are presented in Table 2. Participants in the Stroke Belt exhibited significantly less sedentary behavior, MVPA, and proportion achieving 150 min/wk of MVPA and significantly more LIPA than those in Non-Stroke Belt states. There was significantly higher sedentary behavior and lower LIPA, MVPA and proportion achieving 150 min/wk of MVPA with increasing age. There was significantly higher sedentary behavior and lower LIPA, MVPA and proportion achieving 150 min/wk of MVPA from normal weight to overweight and overweight to obese.

Statistically significant differences were observed among race/sex groups for mean sedentary time, LIPA, MVPA, and proportion achieving 150 min/wk of MVPA (Table 2). White men had significantly lower sedentary time and higher LIPA, MVPA, and proportion achieving 150 min/wk of MVPA than other groups. Black men had similar levels of sedentary time as white and black women, similar amount of LIPA as black women, but less than white women, higher MVPA than white and black women, and higher proportion achieving 150 min/wk of MVPA than black women, but similar to white women.

Despite significant differences, absolute differences in the proportion of total wear time spent in each behavior between race/sex groups were negligible (range 81-83% for sedentary time, 17-18% for LIPA, and 0.3-1.2% for MVPA). When not requiring MVPA in 10-minute bouts, the proportion accumulating 150 min/wk of MVPA ranged from 20-24% between regions, 6-34% across age groups, 13-31% across BMI groups, and 12-30% across race/sex groups. With the 10-min bout criterion, the proportion obtaining 150 min/wk of MVPA was reduced by 35-50%.

The proportion of all participants attaining at least one 10-minute bout of MVPA per week was 36%. Persons 85 years (18.7%), those classified obese (25.4%), and black women (24.2%) exhibited the lowest proportion, and participants 45-64 years (44.5%), those with normal weight (45.7%), and white men (43.8%) the highest proportion (Table 2). The average number of 10-minute bouts/week for all groups was 1.5 ± 0.08 . Values for several groups (Stroke Belt, 75-84 years, 85 years, obese, black women, and white women) were at or near zero bouts/week with no group exhibiting >1.5 bouts/week. Significant differences were noted for region, age, BMI, and race/sex groups for both variables.

Figure 1 shows the proportion of participants by age, region, BMI, and race/sex group accumulating defined levels of MVPA. Other than the 45-64 year age group, MVPA across categories reflected a similar pattern. The 45-64 year age group's pattern is nearly U-shaped with demarcation for the four age groups most apparent in the <37 and 150 min/wk categories. Patterns of accumulated weekly MVPA were nearly identical when displayed by

region. The greatest separation among BMI and race/sex groups was at the two extremes of the configuration. A higher proportion of normal weight and lower proportion of obese and higher proportion of white men and lower proportion of black women, respectively, achieved 150 min/wk of MVPA compared with other groups, with the opposite noted for <37 min/wk. Proportions within other durations of weekly MVPA were comparable across BMI and race/sex groups.

4. Discussion

This study employed an objective measurement of time spent in sedentary behavior and varying intensities of PA in a large sample of community-dwelling midlife and older adults in the U.S. Overall, results indicated midlife and older adults rarely undertook MVPA and accumulated very high levels of sedentary behavior (11-13 hr/day). The subgroups most affiliated with this pattern were those 85 years of age, Stroke Belt residents, and black women. The proportion of wear time spent in sedentary behavior (75-90%) is higher than formerly reported for comparably-aged U.S.,^{18,19,20} Swedish¹⁸ and Norwegian adults,²¹ and similar to UK midlife and older adults^{7,22,23} who wore accelerometers. Differences in mean age, race/ethnicity, health status, social or environmental factors, or devices and data management methodology may account for inconsistent results between studies. Regardless, the amount of time in sedentary behavior for all subgroups was alarmingly high in the current study and supports proposals for interventions to specifically reduce this behavior.^{5,8,9}

Equally concerning was the minimal MVPA accumulated. Across subgroups, mean daily minutes of MVPA ranged from 0-16 minutes accounting for only 0-1.7% of total wear time. These data align with previous results indicating negligible exposure to daily MVPA in adults. Investigators from various countries have reported midlife and older adults devote 1-11% of total wear time to MVPA^{2,21,23} and accumulate 4-41 minutes of MVPA per day.^{7,18,24}

Significant differences by age, region, and BMI for each variable corroborate previous findings with population-based samples demonstrating PA declines with age,^{1,2,17} is less among those with obesity,^{7,18,25} and is lowest in the Southeastern U.S.^{2,3,4} Race/sex comparisons disclosed white and black women at highest risk for exceptionally low levels of health-enhancing PA. White and black women accumulated merely 3-4 min/day of MVPA (0.3-0.4% of total wear time) which is similar to 6-9 min/day of MVPA (<1% of total wear time) of objectively measured PA for a much smaller sample of older white and black women.² As with previous accelerometer studies,^{2,7,17} within a given race/ethnic group, men in the current study were more active than women.

The proportion of adults meeting and not meeting PA guidelines is commonly reported, but the distribution of objectively measured weekly MVPA among those not meeting guidelines has not been described previously. There was interest in what proportion of adults accumulated varying amounts of MVPA as subgroups may display diverse patterns of weekly MVPA. For example, one group's pattern may indicate a substantial proportion of participants near the higher levels of weekly MVPA, whereas others would have the

opposite pattern. Other than the U-shaped pattern noted for the 45-64 age group (Figure 1), the distribution of weekly MVPA was similar across subgroups. Among age, BMI, and race/sex groups, there were notable differences at the far ends of the spectrum, but the proportion of participants accumulating other amounts of weekly MVPA was nearly identical indicating an all-or-nothing involvement with MVPA. This argues for PA behavioral interventions for all subgroups.

The proportion of participants with at least one 10-minute bout/week of MVPA or number of 10-minute bouts/week achieved has rarely been described. Only 36% of midlife and older adults demonstrated at least one 10-minute bout of MVPA per week ranging from ~19% among persons ≥ 85 years to ~44-46% among those age 45-64 years, those of normal weight, and white men. The average number of 10-minute bouts/week was 1.5 for all subgroups reaffirming results of two studies demonstrating few older adults participate in sustained PA of health-enhancing intensity.^{9,29} Considering the all-or-nothing pattern of weekly MVPA and lack of sustained bouts of MVPA, it might be more constructive to recommend to midlife and older adults more and/or longer bouts of LIPA rather than engaging in MVPA.^{19,26} The sample exhibited approximately 2.5 hr/day of LIPA (10-23% of total wear time), which is comparable to other accelerometer studies with older adults.^{7,21,24} The potential health benefits of LIPA or sporadic MVPA of <10 minutes are not well defined,²⁷ but should be delineated in the future as objective measures of LIPA are linked to various health-related outcomes.

The strengths of this study include the large population sample recruited from a well-characterized cohort of midlife and older black and white adults living in the U.S. Participants were extremely compliant with the 7-day protocol providing a large pool of quality accelerometer-derived data. Despite obtaining objective measures of sedentary behavior and PA, there are limitations to using accelerometers including not being able to identify types of PA or capture upper-body or non-ambulatory movement potentially resulting in an under-estimation of total PA. Concerns may arise from participants changing behavior while wearing the device or one week of data not accurately reflecting the person's typical PA pattern. However, the protocol employed reflects currently accepted practice.^{14,17,18} In addition, using standard cut-points to differentiate time spent being sedentary and physically active at varying intensities does not account for differences in fitness levels, especially among older adults. It is possible some PA classified as LIPA by the accelerometer was of sufficient relative intensity to be considered MVPA. Cut-points used were derived from a lab-based validation study with adults with similar demographics,¹⁶ and the non-wear algorithm was developed with a REGARDS subgroup.¹⁵ However, accelerometers calibrated and validated on structured laboratory activities rather than on free-living activities tend to underestimate MVPA.²⁸ Thus, the measured time in MVPA may be underestimated. Lastly, accelerometer counts from a hip worn device can be similar for sitting and standing with negligible movement leading to overestimation of time in sedentary behavior and underestimation of LIPA.²⁹ This is, however, doubtful for older adults whose very low levels of activity over long periods during waking hours likely indicate sitting.³⁰

5. Conclusions

The findings reveal persons 85 years, those classified obese, those in the Stroke Belt, and white and black women were the most sedentary and least active segments studied. However, the vast majority of white and black midlife and older adults in the study, regardless of sex, age, residential location, race, or BMI status, engaged sparingly in MVPA and accumulated tremendous amounts of sedentary behavior each day. In addition, they seldom engaged in continuous bouts of health-enhancing PA. These data indicate a dire need for a wide array of interventions to promote PA and reduce sedentary behavior among midlife and older white and black men and women in the U.S. In addition, future studies, including those involving the REGARDS cohort, will need to determine the health impact of time spent being sedentary, LIPA, and sporadic accumulation of MVPA for diverse subgroups of midlife and older adults.

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Practical implications

- The objective measure of sedentary behavior and PA reveals midlife and older adults seldom engage in continuous bouts of health-enhancing PA.
- The miniscule level of moderate or higher intensity PA accompanied by 11-13 hours of sedentary behavior during wake time reiterates the need for effective interventions targeting both behaviors, especially in high risk subgroups.
- Midlife and older adults accrue substantial amounts of LIPA daily and, although health benefits are not well known, promotion of LIPA should also be considered for future intervention efforts.

Figure 1.
Pattern of accumulated moderate-to-vigorous physical activity (MVPA; minutes per week)
by age, region, body mass index, and race/sex subgroups.

Table 1

Demographic and accelerometer compliance characteristics of study participants (n = 7,967).

	Black Women (n = 1,571)	Black Men (n = 948)	White Women (n = 2,750)	White Men (n = 2,698)
Age (years) ^a	68.6 ± 8.5 ^d (50-97)	69.5 ± 8.3 ^d (51-95)	69.2 ± 8.9 ^d (49-99)	71.2 ± 8.5 ^e (50-95)
Stroke Belt (%) ^g	53.5	50.5	59.9	51.0
Income (%) ^g				
<20,000/yr	22.9	12.2	10.6	4.3
20,000-34,000/yr	27.0	24.2	23.3	17.7
35,000-74,000/yr	29.8	36.6	32.3	40.2
>75,000/yr	10.4	19.3	20.5	30.5
Education (%) ^g				
<High School	34.4	21.3	24.0	20.2
High School Grad	23.3	13.7	34.7	28.4
Some College	20.7	13.4	36.7	29.0
College Grad	15.0	8.9	34.6	41.5
Body Mass Index ^b (%) ^g				
Underweight	0.5	1.1	1.6	0.3
Normal weight	15.9	19.9	34.8	25.1
Overweight	30.7	43.4	34.7	47.2
Obese	52.8	35.5	28.8	27.5
Diabetes (yes, %) ^g	23.6	24.2	10.6	14.2
Hypertension (yes, %) ^g	68.3	60.9	44.2	44.2
Smoking (current, %) ^g	13.4	15.3	9.4	8.8
Valid Wear Days ^c (%) ^g				
4-5 days	17.8	14.7	9.0	8.1
6-7 days	82.2	85.3	91.0	91.9
Valid Wear Days ^{ac}	6.4 ± 0.9 ^d	6.5 ± 0.8 ^e	6.6 ± 0.7 ^f	6.7 ± 0.7 ^f
Wear Time (hr/day) ^a	14.8 ± 2.0 ^d	15.0 ± 2.2 ^e	14.8 ± 1.5 ^d	14.9 ± 1.6 ^e

^a mean ± SD.^b underweight: <18.5 kg m⁻²; normal weight: 18.5-24.9 kg m⁻²; overweight: 25-29.9 kg m⁻²; obese: 30.0 kg m⁻².^c accelerometer yielded usable data for 10 hours per day for 4-7 days.^d race/gender groups with different letters differ at *P* <0.05.^e race/gender groups with different letters differ at *P* <0.05.^f race/gender groups with different letters differ at *P* <0.05.^g significant difference (*P* <0.05) in distribution of proportions within and across race/sex groups for each category of the variable as indicated by Chi-Square.

Table 2

Amount and proportion of time spent in sedentary behavior and physical activity of varying intensity and duration.

Region	Sedentary	LIPA	MVPA	150 min/wk MVPA all counts ^b , % (bouts ^c , %)	MVPA 10-min bouts (% with 1 bout)	MVPA 10-min bouts (bouts/week; Mean ± SE)
	Minutes/day ^a ; Mean ± SE (% of total daily wear time; Mean ± SE)					
Stroke Belt ⁱ	729 ± 2 ^d (82 ± 0.2) ^d	156 ± 2 ^d (18 ± 0.2) ^d	6 ± 0.4 ^d (0.6 ± 0.05) ^d	20 ^d (8) ^d	33.7 ^d	0.5 ± 0.08 ^d
Non-Stroke Belt	733 ± 2 (82 ± 0.2)	150 ± 2 (17 ± 0.2)	7 ± 0.4 (0.8 ± 0.05)	24 (5)	38.9	0.8 ± 0.08
Age						
45-64 years	668 ± 2 ^e (75 ± 0.2) ^e	206 ± 2 ^e (23 ± 0.2) ^e	16 ± 0.4 ^e (1.7 ± 0.05) ^e	34 ^k (12) ^k	44.5 ^l	1.5 ± 0.08 ^e
65-74 years	702 ± 2 ^f (79 ± 0.2) ^f	179 ± 2 ^f (20 ± 0.2) ^f	9 ± 0.4 ^f (1.0 ± 0.04) ^f	22 (9)	37.8	1.0 ± 0.07 ^f
75-84 years	753 ± 2 ^g (84 ± 0.3) ^g	135 ± 2 ^g (15 ± 0.2) ^g	2 ± 0.5 ^g (0.2 ± 0.05) ^g	10 (5)	25.9	0.3 ± 0.09 ^g
85 years	802 ± 4 ^h (90 ± 0.5) ^h	89 ± 4 ^h (10 ± 0.4) ^h	0 ± 0.9 ^h (0.0 ± 0.09) ^h	6 (3)	18.7	0.0 ± 0.12 ^h
Body Mass Index ^j						
Normal Weight	718 ± 2 ^e (81 ± 0.3) ^e	162 ± 2 ^e (18 ± 0.2) ^e	10 ± 0.5 ^e (1.1 ± 0.05) ^e	(13) ^k	45.7 ^l	1.2 ± 0.09 ^e
Overweight	727 ± 2 ^f (82 ± 0.2) ^f	156 ± 2 ^f (18 ± 0.2) ^f	7 ± 0.5 ^f (0.7 ± 0.05) ^f	24 (9)	38.7	0.7 ± 0.08 ^f
Obese	749 ± 2 ^g (84 ± 0.2) ^g	139 ± 2 ^g (16 ± 0.2) ^g	3 ± 0.4 ^g (0.2 ± 0.05) ^g	13 (5)	25.4	0.1 ± 0.09 ^g
Race × Sex						
Black Women	741 ± 2 ^e (83 ± 0.3) ^e	146 ± 2 ^e (17 ± 0.3) ^e	3 ± 0.5 ^e (0.3 ± 0.06) ^e	12 ^k (6) ^k	24.3 ^l	0.4 ± 0.1 ^e
Black Men	735 ± 3 ^{e,f} (82 ± 0.3) ^{e,f}	148 ± 3 ^f (17 ± 0.3) ^e	7 ± 0.6 ^f (0.7 ± 0.07) ^f	20 (7)	32.2	0.6 ± 0.1 ^{e,f}
White Women	730 ± 2 ^f (82 ± 0.3) ^f	155 ± 2 ^g (18 ± 0.2) ^f	4 ± 0.5 ^e (0.4 ± 0.05) ^e	20 (8)	36.2	0.5 ± 0.09 ^f
White Men	719 ± 2 ^g (81 ± 0.29) ^g	160 ± 2 ^h (18 ± 0.2) ^f	11 ± 0.5 ^g (1.2 ± 0.05) ^g	30 (11)	44.2	1.2 ± 0.09 ^g

LIPA = light intensity physical activity; MVPA = moderate-vigorous intensity physical activity

^a all accumulated activity counts within threshold for specific intensity.

^b all accumulated activity counts > 1065 counts/min.

^c 10-minute bout was defined as at least 10 consecutive minutes above activity count (1065 counts/min) threshold with an allowance of 1-2 minutes below threshold.

^d significantly different ($P < 0.05$) from non-Stroke Belt.

- e* within sedentary, LIPA, MVPA or 10-min bouts/week categories: body mass index, age and race/sex subgroups with different letters differ at $P < 0.05$.
- f* within sedentary, LIPA, MVPA or 10-min bouts/week categories: body mass index, age and race/sex subgroups with different letters differ at $P < 0.05$.
- g* within sedentary, LIPA, MVPA or 10-min bouts/week categories: body mass index, age and race/sex subgroups with different letters differ at $P < 0.05$.
- h* within sedentary, LIPA, MVPA or 10-min bouts/week categories: body mass index, age and race/sex subgroups with different letters differ at $P < 0.05$.
- i* includes North Carolina, South Carolina, Georgia, Tennessee, Mississippi, Alabama, Louisiana, and Arkansas.
- j* normal weight: 18.5-24.9 kg.m²; overweight: 25-29.9 kg.m²; obese: 30.0 kg.m².
- k* within 150 min/wk MVPA category, significant difference ($P < 0.05$) in distribution of proportions among age, body mass index and race/sex subgroups as indicated by Chi-Square.
- l* within proportion with at least one 10-min bout/week category, significant difference ($P < 0.05$) in distribution of proportions among categories among age, body mass index and race/sex subgroups as indicated by Chi-Square.