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Utilization of 2013 BRFSS Physical Activity Data for State Cancer Control Plan Objectives: Alabama Data

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Abstract

Objectives—All comprehensive US cancer control plans mention physical activity and implement physical activity promotion objectives as part of these cancer plans. The purpose of this investigation was to describe the physical activities reported by Alabama adults in the 2013 Behavioral Risk Factor Surveillance System (BRFSS) and to compare these activities by age group and relative exercise intensity.

Methods—This investigation used data on 6503 respondents from the 2013 BRFSS sample of respondents from Alabama with landline and cellular telephones. Respondents were asked whether they engaged in any physical activities or aerobic exercises such as running, calisthenics, golf, gardening, or walking. Information was collected on strengthening activities such as yoga, sit-ups, push-ups, and using weight machines, free weights, and elastic bands. Relative exercise intensity was estimated for each aerobic activity by comparing the 60% maximal oxygen uptake with metabolic equivalent values.

Results—Approximately two-thirds (63.7%) of respondents reported that they engaged in exercise in the past 30 days; 45.4% participated in enough aerobic activity per week to meet guidelines, and 25.9% met the muscle-strengthening guidelines. Only 10.1% of respondents 65 years old and older met both aerobic and muscle-strengthening guidelines, compared with 15.2% of those 18 to 64 years old ($P < 0.05$). The most common activity reported for ages 18 to 64 years was walking (53.3%), followed by running (12.7%), and gardening (4.7%). Among adults aged 65 and older, the top three activities were walking (63.2%), gardening (13.3%), and use of a bicycle machine (2.9%). The activity intensity was significantly greater for walking, gardening, and household activities among older adults compared with those younger than age 65.

Conclusions—Because the recommended levels of physical activity are not met by a majority of Alabama residents, it is important to incorporate this information into state cancer objectives. Older adults may have higher relative energy costs compared with younger adults. Future studies should discern whether activities previously classified as low intensity have adequate health benefits, especially for cancer survivors and older adults with comorbidities.

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Keywords

Behavioral Risk Factor Surveillance System; physical activity; cancer control; metabolic equivalents

Maintaining healthy behaviors, including restricting tobacco use, maintaining a normal weight, having access to nutritious foods, and engaging in regular physical activity have been associated with a reduction in the incidence of chronic diseases and in an improvement in quality of life among older individuals. In regard to cancer control planning, primary prevention activities are focused on these objectives; however, by January 2014, the number of cancer survivors in the United States had grown to nearly 14.5 million children and adults. With 197,040 survivors in Alabama, there is a need to apply the principles of healthy lifestyles to cancer survivors.¹ One review discussed the benefits associated with physical activity across the cancer continuum from primary prevention, treatment, and rehabilitation²; however, it is unclear what specific exercise prescriptions are optimal as targeted interventions along this continuum.

The Healthy People 2020 guidelines state that the physical activity goal is to increase the proportion of adults who meet current federal physical activity guidelines for aerobic physical activity and for muscle-strengthening activity. Specifically, one objective is to increase the proportion of adults who engage in aerobic physical activity of at least moderate intensity for at least 150 minutes/week, 75 minutes/week of vigorous intensity, or an equivalent combination. A second objective is to increase the proportion of adults who perform muscle-strengthening activities that work all of the major muscle groups (legs, hips, back, abdomen, chest, shoulders, and arms) on 2 days/week. Combining these two objectives is a measure of the proportion of adults who meet the objectives for aerobic physical activity and for muscle-strengthening activity, as outlined by the Department of Health and Human Services physical activity guidelines.³

The National Comprehensive Cancer Network (NCCN) has released guidelines that pertain to cancer survivorship and healthy lifestyles.⁴ The NCCN panel suggests that sedentary survivors engage initially in one to three light- to moderate-intensity activities per week such as walking or using a stationary bike and begin with one session of resistance training per week. The NCCN also recommends adherence to federal guidelines but acknowledges that most survivors do not meet these recommendations.

As such, as a baseline for a cancer-control plan, it is important to describe the frequency, duration, intensity, and type of activities that individuals currently are engaged in and compare these metrics with the federal guidelines and recommendations from the NCCN. The goal of this report was to describe the physical activity profile of Alabama residents based on the 2013 Behavioral Risk Factor Surveillance System (BFRSS) survey data and describe integration of this profile into state cancer prevention and control objectives.

Methods

Data Sources

The BRFSS uses telephone surveys to collect state data about noninstitutionalized US residents regarding their health-related risk behaviors, including smoking, alcohol use, physical activity, diet, chronic health conditions, and use of preventive services. Surveys of state-based risk behaviors for chronic diseases such as cancer are useful because national or regional estimates may not be representative of the health objectives within each state.

The 2013 BRFSS survey included questions that assess adult participation in aerobic physical and muscle-strengthening activities. The data are freely available and can be downloaded from <http://www.cdc.gov/brfss>. To assess participation, respondents were asked whether they engaged in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking. For individuals who participated in aerobic activity, the type of activity for which they spent the most time during the past month was recorded, how many times per week or month they took part in this activity, and the number of minutes or hours they usually spent on the activity. Respondents were asked what other type of activity gave them the next most aerobic exercise per month and similar responses were recorded. All individuals who indicated any activity in the past month also were asked whether in the past month they had engaged in physical activity, such as yoga, sit-ups, push-ups, and using weight machines, free weights, and elastic bands, to strengthen their muscles, and how many times per week or month they engaged in those activities.

The 2013 BRFSS data continue to reflect the changes initially made in 2011 in weighting methodology and the addition of cellular telephone-only respondents. New methodology, called raking or iterative proportional fitting, allows the incorporation of age, sex, categories of ethnicity, geographical regions within states, marital status, education level, home ownership, and type of telephone (landline or cellular) to reduce bias.

Variables—Age- and sex-specific maximum oxygen consumption was calculated from age and sex. Maximal oxygen uptake ($\text{VO}_{2\text{max}}$) is the body's capacity to transport and use oxygen during a maximal exertion involving dynamic contraction of large muscle groups, such as during walking, running, or cycling. Sex- and age-specific equations are used to estimate the $\text{VO}_{2\text{max}}$ expressed in metabolic equivalents (METs) of each respondent: $\text{VO}_{2\text{max}} (\text{METs}) = 60 - (0.55 * \text{age})$ for men and $\text{MAXVO}_2 = 48 - (0.37 * \text{age})$ for women. One MET is the rate of energy expenditure while sitting at rest and is taken by convention to be an oxygen uptake of $3.5 \text{ mL/kg of body weight per minute}$ (approximately $3.5 \text{ mL} \cdot \text{kg}^{-1} \cdot \text{min}^{-1}$ or $1 \text{ kcal} \cdot \text{kg}^{-1} \cdot \text{h}^{-1}$). Physical activities frequently are classified by their intensity using the MET as a reference, and the aerobic physical activities in the BRFSS survey were assigned a MET value.

The defined minimum intensity for vigorous activities is 60% of maximal oxygen uptake or $\text{VO}_{2\text{max}}$; therefore, the criterion MET value for vigorous activity is 60% of the maximal oxygen uptake (expressed in METs) and is derived from the equation: $(\text{MAXVO}_2/100 * 0.60)/3.5$. Relative exercise intensity was estimated for each aerobic activity by comparing the 60% MAXVO_2 values with MET values. Vigorous activities were defined as MET

values that were greater than or equal to this functional capacity and were assigned a value of 2. Other activities with MET values of ≥ 3 (but not vigorous) were rated as moderate and were assigned a value of 1, and all others were not moderate or vigorous and assigned a 0 rating for relative intensity. The number of minutes engaged in each aerobic activity was derived from the number of minutes of each activity and the frequency per week. The number of minutes per week also was stratified by exercise intensity, and the number of times per week for strength activity also was calculated. Finally, the physical activity categories were derived from the number of minutes per week spent on aerobic activity or vigorous equivalent, as well as muscle-strengthening recommendations.

Missing Data Imputations

For these analyses, there were no imputations for missing data, and the proportions reported may differ slightly from those on the BRFSS Web site, which does not include missing data in proportions on the Web site. Response rates for BRFSS are calculated using standards set forth by the American Association of Public Opinion Research (<http://www.aapor.org>).

Statistical Analysis

Descriptive statistics were calculated as frequency data. Weighted estimates were used in the calculation of means, proportions, and other summary statistics. Relations between demographic factors and meeting physical activity guidelines were identified by orthogonal contrasts for linear and quadratic trends (education, body mass index [BMI]) and logistic regression (age group, sex, and race/ethnicity). Comparisons between age strata for continuous variables were performed by weighted regression analyses in SAS version 9.3 (SAS Institute, Cary, NC) and 95% confidence intervals (CIs) are presented.

Human Participant Compliance

The use of these data were not considered human subject research by the University of Alabama at Birmingham because the data are part of a public use dataset and the following two criteria are met: research did not involve merging any of the datasets in such a way that individuals could be identified, and the researcher did not enhance the public dataset with identifiable or potentially identifiable data.

Results

Of 6503 respondents, adults 18 to 64 years of age comprised 62.6% of the sample and the remainder were 65 years old and older. Among those younger than age 65, 47.9% were between the ages of 18 and 49 and 52.1% were between the ages of 50 and 64. The majority of respondents aged 65 and older were between the ages of 65 and 74 (56.0%) and the remainder were 75 and older (44.0%). Approximately two-thirds (63.7%, 95% CI 61.9–65.4) reported that they had engaged in some exercise in the past 30 days compared with 29.2% (95% CI 27.6–30.8) who reported no exercise, and 7.1% (95% CI 6.0–8.2) of individuals were not sure or refused to answer. The percentage of respondents who reported 150 minutes (or vigorous equivalent) of physical activity per week and met the aerobic recommendations was 40.6% (95% CI 38.8–42.4). Among those who did not achieve 150 minutes, 18.6% (95% CI 17.2–20.0) exercised 1 to 149 minutes; 30.3% (95% CI 28.7–31.8)

reported doing no physical activity; and 10.4% (95% CI 9.2–11.6) did not know, refused to answer, or were not sure. Considering only those individuals who had quantifiable minutes of physical activity, approximately half (45.4%, 95% CI 43.5–47.2) were participating in 150 minutes of exercise/week, whereas 54.6% (95% CI 52.8–56.5) were participating in fewer than 150 minutes/week.

Only 24.3% (95% CI 22.8–25.8) of respondents reported engaging in enough physical activity to meet the recommendation of 300 minutes of aerobic exercise. Approximately one-third (34.4%, 95% CI 32.7–36.1) reported fewer than 300 minutes/week. Approximately 30.3% (95% CI 28.7–31.9) did not report any activity and 11% (95% CI 9.8–11.2) did not know, refused to answer, or were not sure.

Regarding strength recommendations, 22.8% (95% CI 21.2–24.4) reported enough activities to meet the strength recommendations, whereas 68.8% (95% CI 67.1–70.6) reported doing physical activity but not enough to meet the strength recommendations, and 8.4% (95% CI 7.2–9.5) did not know, refused to answer, or were unsure. Of those who participated in strength exercises more than twice per week (excluding missing data), 24.9% (95% CI 23.2–26.6) met the recommendation, whereas 75.1% (95% CI 73.4–76.8) did not meet the recommendations.

Among respondents, 14.1% (95% CI 12.8–15.4) were able to meet both the aerobic and strengthening guidelines, whereas 25.9% (95% CI 24.4–27.4) met the aerobic guidelines only, 7.7% (95% CI 6.5–8.8) met the strengthening guidelines only, 40.8% (95% CI 39.1–42.6) met neither guideline's requirements, and 11.5% (95% CI 10.3–12.9) did not know, refused to answer, or were not sure (Table 1). Considering all respondents and combining the “did not meet guidelines” categories, 15.9% (95% CI 14.5–17.4) participated in enough aerobic and muscle-strengthening exercises to meet the guidelines; however, 84.1% (95% CI 82.7–85.5) did not meet the guidelines for both strength and aerobic activities.

Demographic Factors

As expected, approximately half of Alabama residents did not meet the guidelines for either aerobic or muscle-strengthening activities (Table 1). Meeting both guidelines was more likely among males compared with females (17.3% vs 11.2%, respectively; $P < 0.05$), among those with a college degree compared with a high school education (22.6% vs 10.9%, respectively; $P < 0.0001$), among younger individuals compared with those older than age 65 (15.2% vs 10.1%, respectively; $P < 0.05$), and among normal-weight individuals compared with obese individuals (16.3% vs 10.2%, respectively; $P < 0.0001$). Respondents older than age 65 years also were less likely to meet the muscle-strengthening guidelines compared with younger individuals (4.7% vs 8.4%, respectively; $P < 0.05$).

Specific Activities

The specific activities reported from the 2013 BRFSS survey are reported in Table 2. Data are detailed for those who reported engaging in a second activity. The top 10 ranked activities are shown in Table 3. More than half of the respondents reported walking as the first activity (55.3%), followed by running (10.3%), gardening (6.3%), weight lifting (3.7%),

and other activities (3.1%). For the second reported activity, walking also was the most frequent (10.6%), followed by weight lifting (6.0%), gardening (5.9%), other (5.4%), and running (4.4%). More than one-third (38.7%) of respondents did not report a second activity.

Age Stratification

The prevalence of aerobic activities did vary with age, although walking was the most prevalent activity of either age group (53.3% for ages 18–64 years and 63.2% for ages 65 years; Table 4). Among older adults the activities of gardening (13.3%), yard work (2.4%), and household activities (5.5% as a second activity) also predominated. The majority of older adults (57.7%) reported only one activity. Fewer than 1% of older adults reported a strength activity (weight lifting) as the first activity. When considering the relative intensity, frequency, and duration of three common activities in older adults, the mean relative intensity of walking was significantly greater in adults older than 65 years compared with younger adults (1.4 vs 1.0, respectively; $P < 0.005$; Table 5). The mean number of minutes walking was significantly less for older adults compared with younger adults (43.9 vs 52.5, respectively; $P < 0.005$). Gardening also was considered a vigorous activity for older adults and the relative intensity was significantly greater than for younger adults; however, the average number of minutes per episode was not different. Household activities also were significantly more intense for older adults (1.5) compared with younger adults (1.0, $P < 0.005$) and older adults tended to engage in fewer minutes per activity.

Discussion

This investigation reported the most common leisure activities stratified by age among Alabama residents in 2013. There is evidence that fewer than 50% of respondents met the aerobic recommendations and fewer than 25% met strength guidelines. Given the large burden of cancer in Alabama residents and evidence of positive effects of physical exercise along the cancer continuum,² it is important to consider what further information is needed to incorporate this benefit into a cancer control plan.

Although the metabolic cost of various activities increases with increasing age, the relation between metabolic work and physical impairments is not well studied. Indeed, in the present study the functional capacity was on average 42.8% less in older adults than the respondents ages 18 to 64. A study of older adults 70 to 90 years of age found that adults reporting mobility impairments had lower absolute MET levels but higher relative MET costs adjusted for performance speed.⁵ The studied population included approximately 15% cancer survivors, and the daily activities assessed included standing, walking at a leisurely pace, gardening, household activities, grocery shopping, and stair climbing. The authors found that the normative METs underestimated walking leisurely by 0.87 MET (± 0.12), walking briskly by 0.87 MET (± 0.12), but overestimated gardening (1.46 ± 0.12) and climbing stairs (0.73 ± 0.18).⁵

Another report measured the METs of walking activities and compared the measured METs in older adults from accelerometer output with the normed compendium values.⁶ This sample of 20 adults 61 to 90 years of age found MET values ranging from 3.9 to 6.8 across bouts of walking. The authors noted that the measured MET values indicated that walking at

1.5 mph was a moderate-intensity activity for older adults (3.0 to 5.9 METs), whereas the normed MET value would classify this as only a light-intensity activity. As the authors stated, this misclassification can have implications for public health guidelines that categorize meeting activity guidelines based on moderate to vigorous physical activity.

Evidence has suggested that light-intensity activities (<3.0 MET) are beneficial, particularly for older adults and individuals with moderate to severe comorbidities. A study found that among cancer survivors 65 years of age and older, increasing the level of high light physical activity (2.1 to 2.9 METs) such as light housework, volunteer work, light gardening, and walking leisurely was associated with higher scores for physical functioning.⁷ Indeed, a large benefit may be accrued by the impact of engaging individuals who are sedentary in any activity.

It is important to discern whether low-intensity activities have adequate health benefits. One study of older African Americans (76.5% women and 58.3% obese) found that only 7% met physical activity guidelines, with only 2% of total activity per day (> 0 steps per minute and <100 steps per minute) classified as moderate-intensity activity. In this cross-sectional study, greater low-intensity walking activity was associated with better physical and cognitive outcomes. Low-intensity activity was the type of activity associated with child care and social activities.⁸

A risk-screening survey has been developed to assess which cancer survivors should undergo an evaluation to determine their readiness for moderate- to vigorous-intensity activities.⁹ A questionnaire such as the Physical Activity Readiness Questionnaire for Everyone can be used. Brown et al identified factors that will help cancer survivors undergoing an exercise evaluation before engaging in moderate- to vigorous-intensity exercise.⁹

There are many studied barriers to the achievement of individuals' meeting the federal guidelines including female sex, Hispanic ethnicity, increasing age, lower educational attainment, and increasing BMI. Overweight and obese individuals perceive exercise as more difficult than do lean individuals.¹⁰ A study of long-term cancer survivors found that a BMI of >30 and being physically inactive were important predictors of comorbidity burden in cancer survivors.¹¹ Even short-term exercise programs are associated with an improvement in emotional well-being, social functioning, and a reduction in anxiety among cancer survivors.^{12,13} A study based on the 2011 BRSS data reported that walking was the most common activity overall and among most subgroups examined.¹⁴ Studies also have shown that greater park land density is associated with higher levels of residents who meet activity recommendations.¹⁵ Self-efficacy also is related to independent physical activity among older adults.¹⁶

A limitation of the present study is that the survey does not capture low MET activities, and some activities can overlap in intensity, making it difficult to distinguish the potential benefits. Furthermore, the MET value coding for the various activities is subject to misclassification because there is no stratification within the reported activities.^{17,18} The reliability of self-reported physical activity information may be subject to recall bias and

how the questions are interpreted.¹⁹ Finally, the combined weighted response rate for landline and cellular telephone responses for Alabama was 29.0 (28.0 landline and 32.8 cellular telephone), which was lower than the national rate of 46.4%²⁰; however, this was comparable to other telephone surveys. Research findings show that weighting to demographic characteristics of respondents ensures accurate estimates for most measures.²¹

In conclusion, the results of this study can enable program planners to target efforts to increase physical activity in a cancer-control plan. Ultimately, physical activity recommendations should be tailored to minimize risk and treatment adverse effects while being safe and cost-effective.

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Key Points

- In 2013, 15.9% of Alabamians participated in enough aerobic and muscle-strengthening exercises to meet the physical activity guidelines, but 84.1% did not meet the guidelines for both strength and aerobic activities.
- Only 10.1% of people 65 years old and older met both aerobic and muscle-strengthening guidelines, compared with 15.2% aged 18 to 64 years.
- Among adults age 65 and older, the top three activities were walking (63.2%), gardening (13.3%), and use of a bicycle machine (2.9%).
- The activity intensity was significantly greater for walking, gardening, and household activities among older adults compared with those 18 to 64 years of age.
- Among older adults, small changes in moderate to light activities may have benefits, and future work should examine strategies to improve activity profiles in older populations.

Table 1

Percentage of Alabama respondents meeting aerobic and muscle-strengthening physical activity guidelines by demographic factors, BRFSS, 2013

Characteristics Total (n, %) ^A	% (95% CI)			
	Met both aerobic and strength guidelines (n = 801)	Met aerobic activity guidelines only (n = 1819)	Met muscle-strengthening guidelines only (n = 412)	Did not meet either guideline (n = 2814)
	14.1 (12.8–15.4)	25.9 (24.4–27.4)	7.7 (6.5–8.8)	40.8 (39.1–42.6)
Sex				11.5 (10.3–12.9)
Male (2201, 33.8) ^a	17.3 (15.1–19.5)	26.5 (24.0–29.0)	9.4 (7.4–11.4)	11.8 (9.7–13.9)
Female (4302, 66.2)	11.2 (9.8–12.6) [*]	25.4 (23.5–27.2)	6.1 (4.9–7.2) [*]	11.3 (9.7–12.9)
Age, y				
18–64 (4041, 63.6) ^a	15.2 (13.6–16.7)	24.5 (22.7–26.3)	8.4 (7.0–9.8)	11.4 (9.7–12.9)
65 (2411, 37.4)	10.1 (8.7–11.6) [*]	32.4 (29.9–34.9) [*]	4.7 (3.7–5.9) [*]	10.6 (8.8–12.3)
Race/ethnicity				
White, non-Hispanic (4609, 70.9) ^a	14.0 (12.5–15.4)	28.3 (26.5–30.0)	6.9 (5.7–8.0)	10.0 (8.6–11.3)
Black, non-Hispanic (1582, 24.3)	14.8 (12.3–17.3)	21.5 (18.9–24.5) [*]	7.9 (5.8–10.0)	14.2 (11.4–16.9)
Other, Non-Hispanic (50, 0.8)	22.3 (6.2–38.4)	12.3 (1.9–22.8)	9.3 (0.0–24.7)	3.4 (0.0–7.7)
Multiracial (61, 0.9)	14.7 (3.5–26.0)	17.0 (5.4–28.5)	20.0 (6.0–33.9)	19.3 (5.6–33.0)
Hispanic (131, 2.0)	9.5 (4.6–14.6)	27.6 (15.0–40.3)	5.7 (0.4–11.1)	11.0 (2.7–19.2)
Don't know (70, 1.1)	5.6 (0.0–11.7)	17.9 (8.1–27.7)	8.4 (1.1–15.6)	25.7 (12.1–39.3)
Education				
<High school (798, 12.3)	7.5 (4.4–10.6)	20.9 (16.7–25.1)	8.5 (4.7–12.3)	16.0 (11.6–20.3)
High school (2083, 32.0)	10.9 (8.8–13.0)	23.5 (21.0–26.1)	7.2 (5.3–9.1)	13.1 (10.8–15.4)
Some college (1881, 28.9)	15.8 (13.4–18.2)	28.7 (25.8–31.5) [*]	6.7 (4.9–8.4)	9.6 (4.7–11.5)
College graduate (1724, 26.5)	22.6 (19.8–25.3) [*]	29.6 (26.7–32.5) [*]	9.3 (7.0–11.5) [*]	7.6 (6.0–9.3)
Don't know (17, 0.3)	0.0	35.4 (0, 84.0)	1.3 (0.9–1.7)	54.5 (3.2–100.0)
BMI ^b				
Underweight (98, 1.6)	21.3 (7.5–31.1)	24.7 (13.8–35.6)	5.8 (0.0–15.0)	15.2 (4.7–25.7)

Characteristics Total (n, %) ^A	% (95% CI)				Did not meet either guideline (n = 2814)	Don't know/not sure/refused/missing (n = 657)
	Met both aerobic and strength guidelines (n = 801)	Met aerobic activity guidelines only (n = 1819)	Met muscle-strengthening guidelines only (n = 412)			
Normal (1833, 29.4)	16.3 (13.7–18.9)	27.5(24.4–30.5)	10.4 (7.7–13.0)		34.3 (31.0–37.5)	11.6 (9.3–13.0)
Overweight (2175, 34.8)	16.0 (13.7–18.3)	26.2(23.6–28.7)	7.6 (5.7–9.4)		38.5 (35.6–41.4)	11.9 (9.7–14.0)
Obese (2138, 34.2)	10.2 (8.4–12.0) [*]	25.2(22.6–29.9)	5.8 (4.2–7.3)		49.5 (46.5–52.5) [*]	9.3 (7.2–11.4)

BMI, body mass index; BRFSS, Behavioral Risk Factor Surveillance System; CI, confidence interval.

^AThe placement of the row that begins with 14.1 was confusing in the table as received. Should it go with “Total” or with what?

^{*} $P < 0.05$ for intergroup comparisons (sex, race, age) and $P < 0.0001$ linear trend (education, BMI).

^a Indicates reference category.

^b Underweight BMI < 18.5; normal BMI 18.0–24.5; overweight BMI 25.0–29.9; obese BMI ≥ 30.0. Underweight and normal combined for trend analysis.

Table 2

Type of physical activity engaged in for first activity and second activity, BRFSS 2013, Alabama

	First		Second		MET
	N	%	N	%	
Active gaming devices (eg, Wii Fit, Dance Revolution)	4	0.14	4	0.21	3.8
Aerobics video or class	90	2.22	75	1.48	7.3
Backpacking	0	0.00	0	0.00	7
Badminton	1	0.02	0	0.00	5.5
Basketball	31	1.64	37	1.77	6.5
Bicycling machine exercise	76	1.31	84	1.48	6.8
Bicycling	64	1.79	72	1.71	6.8
Boating (eg, canoeing, rowing, kayaking, sailing for pleasure or camping)	2	0.03	1	0.01	5.8
Bowling	8	0.27	3	0.04	3.8
Boxing	2	0.08	2	0.16	12.8
Calisthenics	46	1.39	34	1.23	3.8
Canoeing/rowing in competition	3	0.08	2	0.04	12.5
Carpentry	3	0.10	4	0.04	3.0
Dancing (eg, ballet, ballroom, Latin, hip hop)	19	1.61	31	0.51	7.8
Elliptical/elliptical machine exercise	56	1.40	42	0.95	5.0
Fishing from river bank or boat	11	0.27	33	0.80	3.5
Frisbee	0	0.00	6	0.37	3.0
Gardening (eg, spading, weeding, digging, filling)	368	6.30	352	5.85	5.0
Golf (with motorized cart)	52	1.12	41	1.22	3.5
Golf (without motorized cart)	13	0.34	8	0.27	4.3
Handball	0	0.00	1	0.03	12.0
Hiking (eg, cross-country)	8	0.41	11	0.47	6.0
Hockey	0	0.00	0	0.00	8.0
Horseback riding	2	0.14	9	0.21	5.5
Hunting large game (eg, deer, elk)	1	0.05	7	0.12	6.0
Hunting small game (eg, quail)	2	0.06	5	0.19	5.0
Inline skating	0	0.00	0	0.00	9.8
Jogging	32	1.49	22	0.81	7.0
Lacrosse	2	0.10	0	0.00	8.0
Mountain climbing	1	0.00	1	0.08	8.0
Mowing lawn	14	0.25	51	1.50	5.5
Paddleball	0	0.00	0	0.00	6.0
Painting/wallpapering house	0	0.00	1	0.02	3.3
Pilates	3	0.03	9	0.12	0.0
Racquetball	0	0.00	4	0.11	7.0
Raking lawn	8	0.07	11	0.23	3.8

	First		Second		MET
	N	%	N	%	
Running	215	10.32	91	4.41	6.0
Rock climbing	1	0.06	2	0.25	8.0
Rope skipping	0	0.00	1	0.01	11.0
Rowing machine exercise	2	0.03	0	0.00	7.0
Rugby	0	0.00	1	0.01	6.3
Scuba diving	0	0.00	0	0.00	7.0
Skateboarding	1	0.16	2	0.28	5.0
Skating (eg, ice or roller)	0	0.00	0	0.00	7.0
Sledding (eg, tobogganing)	0	0.00	0	0.00	7.0
Snorkeling	2	0.08	1	0.00	5.0
Snow blowing	0	0.00	0	0.00	2.5
Snow shoveling by hand	0	0.00	0	0.00	5.3
Snow skiing	0	0.00	0	0.00	7.0
Snowshoeing	0	0.00	0	0.00	7.0
Soccer	6	0.412	5	0.30	7.0
Softball/baseball	8	0.22	8	0.30	5.0
Squash	0	0.00	0	0.01	7.3
Stair climbing/Stairmaster	5	0.12	11	0.23	9.0
Stream fishing in waders	0	0.00	0	0.00	6.0
Surfing	0	0.00	1	0.03	3.0
Swimming	34	0.82	48	1.31	6.0
Swimming in laps	18	0.42	5	0.25	5.8
Table tennis	0	0.00	0	0.00	4.0
Tai chi	0	0.00	3	0.04	0.0
Tennis	18	0.45	12	0.31	7.3
Touch football	1	0.08	3	0.18	8.0
Volleyball	1	0.00	2	0.03	3.0
Walking	2521	55.34	449	10.57	3.5
Waterskiing	2	0.03	0	0.00	6.0
Weight lifting	73	3.65	163	5.97	0.0
Wrestling	1	0.02	0	0.00	6.0
Yoga	12	0.31	23	0.48	0.0
Child care	5	0.36	23	0.65	3.5
Farm/ranch work (eg, caring for livestock, stacking hay)	8	0.18	14	0.33	4.8
Household activities (eg, vacuuming, dusting, home repair)	38	0.92	208	3.71	3.3
Karate/martial arts	0	0.00	4	0.29	10.3
Upper body cycle (eg, wheelchair sports, ergometer)	5	0.03	5	0.07	4.3
Yard work (eg, cutting/gathering wood, trimming hedges)	61	1.05	158	3.34	4.0

	First		Second		MET
	N	%	N	%	
Don't know/not sure	1	0.02	10	0.20	4.5
Other	119	3.10	211	5.41	4.5
Refused	6	0.12	21	0.32	—
Total	4086	100.0	4058 ^a	100.0	

Percentages and means are weighted to population characteristics. BRFSS, Behavioral Risk Factor Surveillance System; MET, metabolic equivalent.

^a38.7% reported no other activity.

Table 3

Top 10 ranked first- and second-reported activities, intensity, frequency, and duration for Alabama, 2013

		Mean (95% CI)			
	%	Activity intensity	Min	Frequency/wk	Min/wk
First activity (n = 4086)					
Walking	55.3	1.1 (1.1-1.1)	50.6 (47.2-53.9)	3.8 (3.6-3.9)	192.9 (178.8-206.9)
Running	10.3	1.2 (1.1-1.2)	50.4 (45.3-55.5)	3.7 (3.4-4.1)	201.2 (161.9-240.6)
Gardening	6.3	1.7 (1.6-1.7)	118.4 (105.0-131.8)	2.9 (2.6-3.2)	356.3 (285.8-426.7)
Weight lifting	3.7	0 ^a	62.7 (53.1-72.3)	3.9 (3.3-4.5)	-
Other	3.1	1.2 (1.2-1.3)	74.9 (51.5-98.3)	4.3 (3.2-5.4)	406.4 (115.0-697.7)
Aerobics video/class	2.2	1.9 (1.8-2.0)	59.5 (42.0-77.0)	3.6 (2.9-4.2)	233.8 (94.5-373.2)
Bicycling	1.8	1.9 (1.8-2.0)	49.0 (39.6-58.3)	3.1 (2.6-3.7)	166.4 (115.2-217.6)
Basketball	1.6	1.3 (1.1-1.5)	97.5 (78.4-116.5)	2.3 (1.7-2.9)	237.0 (155.3-318.8)
Jogging	1.5	1.5 (1.3-1.8)	44.8 (38.1-51.4)	3.4 (2.4-4.4)	163.2 (101.5-224.9)
Elliptical machine	1.4	1.3 (1.2-1.5)	38.6 (31.5-45.6)	3.1 (2.8-3.5)	121.5 (95.2-147.7)
Second activity (n = 4058)					
Walking	10.6	1.1 (1.0-1.1)	44.2 (37.2-51.3)	3.0 (2.7-3.4)	146.7 (96.5-196.9)
Weight lifting	6.0	0 [†]	49.9 (43.8-56.0)	3.2 (2.9-3.5)	-
Gardening	5.9	1.6 (1.5-1.7)	101.0 (88.2-113.8)	2.9 (2.5-3.2)	320.9 (240.3-401.4)
Other	5.4	1.3 (1.2-1.3)	79.8 (61.0-98.7)	3.1 (2.7-3.5)	264.1 (179.8-348.3)
Running	4.4	1.2 (1.1-1.2)	40.9 (35.0-46.8)	2.5 (2.1-2.9)	112.9 (84.3-141.5)
Household activity	3.7	1.1 (1.0-1.1)	106.2 (89.5-123.0)	4.3 (3.8-4.7)	457.5 (356.2-558.7)
Yard work	3.3	1.3 (1.2-1.4)	113.7 (97.6-129.8)	1.8 (1.5-2.2)	238.2 (163.2-313.1)
Basketball	1.8	1.3 (1.1-1.4)	102.2 (76.2-128.2)	2.6 (1.8-3.4)	227.9 (131.9-323.8)
Bicycling	1.7	1.7 (1.5-1.8)	63.9 (48.4-79.4)	1.5 (1.2-1.8)	83.9 (58.5-109.4)
Mowing lawn	1.5	1.6 (1.4-1.8)	113.9 (92.5-135.2)	1.3 (1.0-1.7)	166.3 (103.5-229.0)
No other activity	38.7	—	—	—	—

Percentages and means are weighted to population characteristics. CI, confidence interval.

^a Counted as strength activity.

Table 4

Top 10 ranked first- and second-reported activities stratified by age for Alabama residents, 2013 BRFSS data

Age <65 y (n = 4041)		Age ≥ 65 y (n = 2411)	
First activity (%)	Second activity (%)	First activity (%)	Second activity (%)
Walking (53.3)	Walking (10.2)	Walking (63.2)	Walking (12.4)
Running (12.7)	Weight lifting (6.6)	Gardening (13.3)	Gardening (10.6)
Gardening (4.7)	Other (5.6)	Bicycle machine (2.9)	Yard work (6.1)
Weight lifting (4.3)	Running (5.4)	Other (2.7)	Household (5.5)
Other (3.2)	Gardening (4.7)	Yard work (2.4)	Other (4.4)
Aerobic video (2.3)	Household (3.3)	Golf, with cart (2.2)	Weight lifting (3.3)
Basketball (2.0)	Yard work (2.7)	Aerobics class (1.7)	Bicycle machine (2.4)
Bicycling (1.9)	Basketball (2.2)	Bicycling (1.1)	Golf, with cart (1.4)
Jogging (1.8)	Bicycling (1.6)	Calisthenics (1.0)	Aerobic video (1.3)
Elliptical (1.5)	Mowing lawn (1.3)	Weight lifting (0.9)	Mowing lawn (1.2)
	None (37.8)		None (42.3)

Percentages are weighted to population characteristics. BRFSS, Behavioral Risk Factor Surveillance System.

Table 5

Intensity, frequency, and duration of three activities stratified by age for Alabama residents, 2013 BRFSS data

Activity	Mean (95% CI)			
	Intensity	Min	Frequency/wk	Min/wk
Walking				
18–64 y (n = 1541)	1.0 (1.0–1.0)	52.5 (48.3–56.7)	3.7 (3.5–3.8)	195.2 (178.0–212.4)
65 y (n = 953)	1.4 (1.4–1.5) [†]	43.9 (40.3–47.4) [†]	4.2 (4.0–4.4) ^a	186.4 (166.7–206.2)
Gardening				
18–64 y (n = 166)	1.4 (1.3–1.5)	125.7(105.3–146.0)	2.9 (2.4–3.4)	377.2 (267.6–487.8)
65 y (n = 200)	2.0 (2.0–2.0) [†]	107.8 (93.6–122.0)	2.9 (2.6–3.3)	325.2 (257.7–392.7)
Household activity				
18–64 y (n = 19)	1.0 (1.0–1.0)	148.6(111.2–186.0)	4.9 (3.5–6.4)	810.5 (547.0–1164.0)
65 y (n = 19)	1.5 (1.1–1.8) [†]	111.8 (54.3–169.4)	5.1 (3.5–6.6)	641.1 (202.8–1079.4)

Means are weighted to population characteristics. BRFSS, Behavioral Risk Factor Surveillance System; CI, confidence interval.

^a Significantly different by age, $P < 0.005$.