

# Physical Activity Levels Among Overweight and Obese Adults in South Carolina

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**Background:** Obesity in the United States has reached epidemic proportions and is a major cause of morbidity and mortality.

**Methods:** We describe the activity levels of South Carolina adults on the basis of data derived from the Centers for Disease Control and Prevention Behavioral Risk Factor Surveillance System.

**Results:** Overweight and obese men and women reported less leisure time physical activity than did people of normal weight, with women found to be less active than men.

**Conclusion:** Physical inactivity is more prevalent among obese and overweight men and women than among people of normal weight. Visiting the physician's office offers a unique opportunity to educate patients about the health benefits and appropriate amount of physical activity.

**Key Words:** obesity, overweight, physical activity

Obesity has become an epidemic in American adults.<sup>1</sup> In 2000, more than 50% of Americans were overweight, and of those, nearly 20% were obese.<sup>1</sup> The health consequences of overweight and obesity are severe. Both are directly related to increased incidence of cardiovascular disease, diabetes mellitus type 2, hypertension, stroke, dyslipidemia, osteoarthritis, some cancers, and decreased physical function.<sup>2,3</sup>

One of the proposed reasons for the obesity epidemic is the lack of physical activity in the United States. The Centers for Disease Control and Prevention (CDC) and the American College of Sports Medicine (ACSM) recommend that all adults engage in at least 30 minutes of moderate physical activity on 5 or more days of the week or at least 20 minutes of vigorous physical activity on 3 or more days of the week to reduce the risk of chronic illness.<sup>3,4</sup> Physical activity can be accumulated by engaging in a variety of activities, such as climbing stairs, doing household chores, gardening, and participating in recreational activities as long as their intensity is equivalent to brisk walking.<sup>4</sup> Nearly 25% of American adults report no leisure time activity, however, and more than 60% are not regularly active at levels sufficient to reduce their risk for chronic disease.<sup>3</sup> Furthermore, overweight individuals are more likely to be inactive, with 33% of overweight men and 41% of overweight women reporting no leisure time physical activity.<sup>5</sup>

Physical activity is recommended to achieve health improvement in overweight and obese individuals.<sup>6</sup> Regular participation in physical activity decreases the risk for developing cardiovascular disease, diabetes, hypertension, dyslipidemia, and some cancers.<sup>3</sup> It also is associated with decreased mortality rates as a result of cardiovascular disease, as well as lower all-cause mortality.<sup>3</sup> Little is known about

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## Key Points

- Activity levels among overweight and obese South Carolinians are lower than those of their lean counterparts.
- There are definite sex differences in physical activity preferences; however, there are few differences by activity level or BMI group within the same sex.
- Even among overweight and obese individuals, a reduction in the risk of many health outcomes has been demonstrated with increased physical activity.
- Given the many adverse effects of obesity, people should be advised to increase their activity to obtain maximal health benefits as well as aid in weight reduction or maintenance.

the physical activity levels of overweight and obese adults in South Carolina. Therefore, the purpose of this study was 1) to describe the physical activity status of lean, overweight, and obese men and women and 2) to determine the physical activity preferences and levels among lean, overweight, and obese men and women.

## Methods

Data derived from the 2000 South Carolina Behavioral Risk Factor Surveillance System (BRFSS) were used for this analysis. The BRFSS is administered yearly to a sample of South Carolina residents with a telephone random-digit-dialing technique. The survey was designed by the CDC to assess the prevalence of behavior-related risk factors associated with chronic disease in adults 18 years of age or older.

Respondents ( $n = 3,175$ ) included 1,309 men and 1,866 women. Body mass index (BMI) was categorized as lean ( $<25 \text{ kg/m}^2$ ), overweight ( $25\text{--}29.9 \text{ kg/m}^2$ ), or obese ( $>30 \text{ kg/m}^2$ ) on the basis of participants' self-reported weight and height. Leisure time physical activity was assessed for the two most frequent activities in which respondents participated during the past month. The average frequency and duration of activity were determined for each physical activity. On the basis of their responses, respondents were classified as inactive (ie, no physical activity), insufficiently active (ie, some physical activity but less than CDC-ACSM recommended levels), or sufficiently active (ie, at CDC-ACSM recommended levels). The recommended levels of activity were set at 30 min/d moderate activity at least 5 d/wk or 20 min/d vigorous activity at least 3 d/wk.<sup>4</sup>

The prevalence of the three activity levels was determined for each BMI classification within sex categories. Among individuals who were insufficiently active and overweight or obese, the five most commonly reported activities by sex were determined. The top five activities reported also were calculated for respondents who were lean and sufficiently active. SAS-callable SUDAAN statistical software

(version 7.5.4; Research Triangle Institute, Research Triangle Park, NC) was used in all analyses. Weighted frequencies were calculated on the basis of the complex sampling design of the BRFSS survey.

## Results

Physical activity levels decreased as BMI increased, regardless of sex. Moreover, both overweight and obese women were less active than men within the same BMI category. Lean individuals were the most active, with 29.5% of both sexes reported meeting recommended physical activity levels (Table 1).

The physical activity preferences for lean, sufficiently active men and women are listed in Table 2. The most common activities for both men and women were walking and running. Although more women than men reported walking (48 versus 25%), women were less likely than men to choose running as an activity (11 versus 20%). Other activity preferences among women were participation in aerobics classes, gardening, and exercising at home. Men preferred calisthenics, weightlifting, and golfing.

Tables 3 and 4 show the physical activity preferences of overweight or obese individuals who were insufficiently or sufficiently active. As with lean individuals, walking was the most commonly reported physical activity among the insufficiently and sufficiently active groups for both sexes. A greater percentage of insufficiently active women than insufficiently active men reported walking (72 versus 36%). In all three physical activity categories, men reported walking, running, weightlifting, and golfing; however, the order of preference of the three categories varied. Women in the three categories of physical activity reported walking, gardening, and participating in aerobics classes in varying order of preference. Running was reported by 4% of those women who were sufficiently active, but it was not among the top five activities among insufficiently active women. Sufficiently and in-

**Table 1. Physical activity levels of men and women by body mass index, according to South Carolina Behavioral Risk Factor Surveillance System self-report<sup>a</sup>**

Respondent group	No. of respondents	Inactive (%)	Insufficiently active (%)	Met recommendations (%)
Men ( $n = 1,309$ )				
Lean	425	23.6%	46.9%	29.5%
Overweight	603	23.4%	48.8%	27.8%
Obese	281	31.8%	48.9%	19.3%
Women ( $n = 1,866$ )				
Lean	891	22.4%	48.1%	29.4%
Overweight	531	32.2%	44.5%	23.3%
Obese	444	41.7%	41.9%	16.4%

<sup>a</sup>BMI ( $\text{kg/m}^2$ ) categories: lean,  $<25$ ; overweight,  $25\text{--}29.9$ ; obese,  $\geq 30$ . Activity categories: inactive, no physical activity; insufficient, some physical activity but not enough to meet recommendations; met recommendations,  $\geq 30$  min physical activity  $\geq 5$  d/wk or  $\geq 20$  min vigorous physical activity  $\geq 3$  days per week.

**Table 2. Five most common physical activities of lean, sufficiently active men and women, according to South Carolina Behavioral Risk Factor Surveillance System self-report<sup>a</sup>**

Activity	% of respondents
Women (n = 429)	
Walking	48%
Running	11%
Aerobics classes	8%
Gardening	7%
Exercising at home	4%
Men (n = 435)	
Walking	25%
Running	20%
Calisthenics	11%
Weightlifting	6%
Golf	6%

<sup>a</sup>Lean, BMI <25 kg/m<sup>2</sup>; sufficiently active, 30 min/d moderate activity ≥5 d/wk or 20 min/d vigorous activity ≥3 d/wk. Data represent a subsample of all activities and do not sum to 100%.

sufficiently active overweight or obese women reported swimming laps, but it was not commonly reported among lean women.

## Discussion

Overweight and obesity are associated with greater risk of dyslipidemia, non-insulin-dependent diabetes mellitus, hy-

**Table 3. Five most common physical activities among insufficiently active men and women who are overweight or obese, according to South Carolina Behavioral Risk Factor Surveillance System self-report<sup>a</sup>**

Activity	% of respondents
Women (n = 429)	
Walking	72%
Gardening	8%
Aerobics classes	3%
Exercising at home	3%
Swimming laps	2%
Men (n = 435)	
Walking	36%
Golf	10%
Gardening	9%
Weightlifting	8%
Running	5%

<sup>a</sup>Overweight or obese, BMI ≥25 kg/m<sup>2</sup>; insufficiently active, some physical activity but not enough to meet recommendations. Data represent a subsample of all activities and do not sum to 100%.

**Table 4. Five most common physical activities among sufficiently active men and women who are overweight or obese, according to South Carolina Behavioral Risk Factor Surveillance System self-report<sup>a</sup>**

Activity	% of respondents
Women (n = 429)	
Walking	61%
Gardening	9%
Swimming laps	6%
Aerobics classes	4%
Running	4%
Men (n = 435)	
Walking	34%
Running	17%
Weightlifting	13%
Gardening	5%
Golf	7%

<sup>a</sup>Overweight or obese, BMI ≥25 kg/m<sup>2</sup>; sufficiently active, 30 min/d moderate activity ≥5 d/wk or 20 min/d vigorous activity ≥3 d/wk. Data represent a subsample of all activities and do not sum to 100%.

pertension, coronary heart disease, congestive heart failure, osteoarthritis, some cancers, sleep apnea, gallstones, and depression.<sup>7</sup> The latest estimates indicate that 300,000 U.S. adults die as a result of obesity-related causes each year.<sup>1</sup> Both environmental and psychological elements contribute to weight gain; however, physical activity has been proved to aid in weight loss and weight maintenance.<sup>7,8</sup> Overweight and obese South Carolinians were less active than individuals of normal weight, and they comprised a greater proportion of the inactive group and a smaller proportion of the active group. Obese or overweight women were less active than obese or overweight men. Few differences in activity preferences between groups within the same sex were noted. The most common activity among men and women was walking, regardless of physical activity or BMI category.

Almost half of overweight and obese people were insufficiently active. Although these South Carolinians reported some activity, the frequency, duration, or intensity was not sufficient to maximize health benefits. It is important to educate overweight and obese people about the appropriate frequency and duration of moderate and vigorous physical activity that will provide the maximum health benefits. In the insufficiently active group, the most common activities reported by women were walking, gardening, aerobics, exercising at home, and swimming, whereas men commonly reported walking, golfing, gardening, weightlifting, and running. Thus, physicians may be able to provide sex-specific activity suggestions that might increase patients' enjoyment and ultimately encourage long-term participation.

Activity preferences did not vary greatly between activ-

ity or BMI categories among people of the same sex. This finding suggests that the inability of overweight or obese people to lose or maintain weight may be a result in part of differences in the duration, frequency, and intensity of activities rather than differences in activity choices. Hence, patient education by health professionals on the proper frequency, duration, and intensity of physical activity is emphasized.

Health professionals should be encouraged to promote leisure time physical activity as well as lifestyle physical activity among overweight and obese patients.<sup>9</sup> Lifestyle activities that contribute to an individual's overall fitness level may be incorporated more easily into a busy or stressful lifestyle than leisure time activities. Examples of lifestyle activities include taking the stairs rather than the elevator, parking as far as possible from buildings, and walking instead of driving for transportation. Contrary to popular opinion, counseling by health care providers can be an effective tool to increase patients' physical activity levels.<sup>9</sup>

In a recent report, the Institute of Medicine stated, "To prevent weight gain as well as to accrue additional, weight-independent health benefits of physical activity, 60 minutes of daily moderate intensity physical activity is recommended, in addition to the activities required by a sedentary lifestyle."<sup>6</sup> Although this amount of physical activity has been recommended for weight maintenance or weight loss, as little as 30 min/d physical activity has been shown to provide health benefits.<sup>3,4</sup> Weight loss and weight maintenance can be an important benefit of physical activity; however, a significant reduction in mortality and cardiovascular disease has been demonstrated even among overweight and obese individuals who are fit.<sup>10</sup> The risk of mortality and cardiovascular disease in fit overweight or obese men has been shown to be lower than that of inactive lean men.<sup>10</sup> Thus, the benefits of physical activity on health outcomes do not seem to be mediated solely by a reduction in weight.

This study is not without its limitations. By design, only leisure time physical activity is reported on the South Carolina BRFSS. Household, transportation, and occupational activities are not recorded. Reporting only leisure time physical activity may underestimate its prevalence, because many domains contribute to a person's overall fitness and activity level. In addition, the survey relies on respondents' self-reported weight and height, which has been found to be biased.<sup>11</sup> Men have a tendency to overestimate their height, whereas women tend to underestimate their weight.<sup>12</sup> Either one of these types of errors will result in recording BMI as being lower than the respondent's true BMI. Consequently, the data in this study actually may underestimate the number of obese and overweight people.

Although the study has some limitations, it also has many strengths. The first step in the investigation of any public health problem is to ascertain the distribution of relevant factors in the population; hence, this study reports activity levels among overweight and obese people in South Carolina.

Geographic or regional differences in overall physical activity levels and many obesity-related disorders have been noted.<sup>1</sup> Thus, it is important to document these differences within subpopulations of each geographic region. In addition, the use of random-digit dialing ensures that the sampled population accurately reflects the total population of South Carolina.

South Carolina, like the rest of the United States, is facing an obesity epidemic, with the majority of South Carolina residents currently reporting an overweight or obese weight.<sup>1</sup> The southeastern region of the United States seems to be particularly affected by this epidemic. Most states comprising this region, such as Tennessee, North Carolina, South Carolina, Georgia, and Alabama, report obesity prevalences in excess of 20%.<sup>1</sup> Similarly, an increase in obesity-related disorders such as diabetes also has been documented.<sup>1</sup> This trend may decrease if South Carolinians become more active. Other states in the Southeast report levels of inactivity similar to those found in South Carolina, with estimates ranging from 32.5% in Alabama to 40.8% in North Carolina and Tennessee.<sup>13</sup> Regardless of the issue of weight loss and weight maintenance, physical activity has been found to decrease all-cause mortality, even among obese individuals who are fit.<sup>14</sup> The physician's office is an ideal environment in which to counsel patients about the value of physical activity. Not only the health benefits but also the appropriate frequency, duration, and intensity of activity needed to realize these benefits should be emphasized for both lean and overweight or obese patients.

## Conclusion

The prevalence of physical inactivity is higher among overweight and obese South Carolinians than among their normal weight counterparts. Similarly, the prevalence of either insufficient or recommended activity levels is lowest in these groups. Among all levels of physical activity, walking is the most common activity choice. There are definite sex differences with regard to physical activity preferences; however, there are few differences by activity level or BMI group within the same sex. Aside from walking, men prefer activities such as golfing, weightlifting, and running, whereas women prefer running, aerobics, gardening, and swimming laps. Given the many adverse effects of obesity, people should be advised to increase their activity in order to obtain maximal health benefits as well as aid in weight reduction or maintenance.

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**■** *You cannot just go on being a good egg.  
You must either hatch or go bad.*

—C.S. Lewis