
Progress Toward Healthy People 2000

Physical Activity and Weight Status in Eastern North Carolina

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Being physically active can lead to important health gains for adults and children. On the other hand, being inactive increases morbidity and mortality among adults.^{1,2} In order to achieve health benefits, the Centers for Disease Control and Prevention (CDC) and American College of Sports Medicine (ACSM) recommend that adults accumulate 30 minutes or more of moderately intense physical activity on most—preferably all—days of the week.³ A recent study found that only 32% of adults met this recommended guideline for physical activity.⁴ More than 25% of black adults report no leisure time physical activity at all, and regional data demonstrate that physical inactivity, on average, is highest in the Southeastern US.⁵ Patterns of physical activity vary by gender, race, and age. Men tend to have higher levels of physical activity than women; whites tend to have higher levels than blacks or other minority populations; children tend to have higher levels than adults.^{2,3,6} Despite the known benefits of physical activity on overall health, it has proven difficult to increase the physical activity status of the population.

As might be expected from the health benefits of physical activity, *inactivity* is associated with higher direct medical costs.⁷ Using data from the National Medical Expenditures Study, Pratt et al estimated that participation in moderate-intensity physical activity by all sedentary adults would reduce medical costs by \$76.6 billion annually.⁷ These findings lend financial support to the public health need to lessen the health impact of physical inactivity.

An increasing prevalence of obesity and type 2 diabetes among adolescents has heightened concern about the lack of physical activity and poor fitness of our youth.^{8,9} Data indicate that risk factors like obesity, hyperlipidemia, and physical inactivity may track from childhood into adulthood.^{10,11}

Cardiovascular disease remains the number one cause of mortality among US adults; it is quite possible that cardiovascular risk status is set early in adolescence, thereby leading to cardiovascular morbidity in the future.

Obesity is a considerable risk factor for heart disease and diabetes, but also for high blood pressure, osteoarthritis and some cancers.^{2,12} The prevalence of obesity among adults increased by 49% between 1991 and 1998; the largest increases occurred among the youngest adults (18-29 years old), people with some college education, and people of Hispanic ethnicity.⁹ The region with the largest increase in obesity (67%) was the South.⁹ Among US adolescents, the percentage of overweight girls increased from 5.4% in 1980 to 11% in 1994, and boys from 4.5% to 11.8%.¹³ Currently, 23% of US adults and 11% of youth are obese. As with physical inactivity, the direct health care costs are high: an estimated \$52 billion per year.¹⁴

Several national directives have called for improvements in physical activity levels and physical fitness of the population.^{2,3,15} Healthy People 2000, and the more recent Healthy People 2010, have set national agendas for promoting physical activity and reducing obesity.¹⁶ According to the Healthy People 2000 Review (1999) the nation met only one of the 13 physical activity and overweight goals. The met goal was that the proportion of worksites offering employer-sponsored physical activity and fitness programs increased in all categories of worksite size.¹⁷

In the current study we examined the current status of the Healthy People 2000 physical activity and weight goals in several counties in eastern North Carolina. We also suggest areas of concentration for the next decade in order to meet the Healthy People 2010 goals.

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Table 1. Demographics of respondents

	Adult Survey (MAQ)	Adolescent Survey (MAQ-A)
Male	274 (26%)	470 (48%)
Female	792 (74%)	519 (53%)
White	545 (52%)	433 (44%)
Black	489 (46%)	492 (49%)
Other	19 (2%)	71 (7%)
Mean age (range)	54.9 (18-98)	13.8 (12-16)
Total participants	1067	998

Methods

Data for this study were derived from two separate cross-sectional surveys administered in several eastern North Carolina counties. Each survey consisted of questions related to demographics, weight, and physical activity. The Human Subjects Committee at the sponsoring institution approved both survey instruments.

Modifiable Activity Questionnaire for Adolescents (MAQ-A). Fourteen public middle schools in three eastern North Carolina counties were surveyed in the spring of 2000. All eighth grade students present, and with passive parental consent, participated in the study (n=998). The MAQ-A, which measures leisure-time physical activity, has been previously validated in an adolescent population.¹⁸ Trained middle school teachers administered the questionnaire.

Modifiable Activity Questionnaire (MAQ). The MAQ was part of a larger survey administered to adults in four eastern North Carolina counties by personal interview (n = 1067). To address issues and concerns for county residents who are medically underserved, we over-sampled respondents without a regular doctor and/or health insurance. Trained interviewers administered the survey. Topics included in this survey were demographics, socioeconomic data, a family and personal health history, self-reported height and weight, and the MAQ, which measures occupational and leisure-time physical activity.

Responses to the two questionnaires allowed us to measure progress of eastern North Carolina youth and adults toward the Healthy People 2000 objectives. We list here the numbered Healthy People 2000 objectives and sub-objectives (in parentheses) addressed and, where appropriate, the questions from our surveys used for comparison.

Overweight Objectives: (1.2) Reduce overweight to a prevalence of no more than 20% among people aged 20 and older, (1.2a) 25% among low-income women aged 20 and older, (1.2b) 30% among black women age 20 and older, (1.2e) 25% among people with disabilities, (1.2f) 41% among women with high blood pressure, and (1.2g) 35% among men with high blood pressure.

Height and weight were self-reported. Overweight for adults was defined by a body mass index (weight in kilograms/height in meters²) ≥ 27.3 kg/m² for women and ≥ 27.8 kg/m² for men. Income was based on self-reported family income, and disability status was determined if the respondent reported "disabled" when queried about their occupation.

Physical Activity Objectives: (1.3) Increase to at least 30% the proportion of people aged 6 and older who engage

regularly, preferably daily, in light to moderate physical activity for at least 30 minutes per day. Data were obtained from the following MAQ-A question: "How many times in the past 14 days have you done at least 20 minutes of light exercise that was not hard enough to make you breathe heavily and your heart beat fast?" A response of 6 or more days constituted light to moderate activity.

(1.4) Increase to at least 20% the adults and to at least 75% the youth aged 6–17 who engage in vigorous physical activity to promote cardiorespiratory fitness ≥ 3 days/week for ≥ 20 minutes/session. For youth, data were obtained from the following MAQ-A question: "How many times in the past 14 days have you done at least 20 minutes of exercise hard enough to make you breathe heavily and make your heart beat fast?" A response of 6 or more days constituted vigorous activity. For adults, vigorous physical activity was defined as participating in at least one of the following activities at least 12 times/month for a minimum of 20 minutes each time for at least 6 of the previous 12 months: jogging, water sports, bicycling, team sports, individual sports, dancing, aerobics, and exercise machines. (1.4a) Increase to at least 12% the proportion of lower-income adults (family income $< \$20,000$ /year) who engage in vigorous physical activity that promotes cardiorespiratory fitness ≥ 3 days/week for ≥ 20 minutes per occasion. (1.4b) Increase to at least 17% the proportion of black adults who engage in vigorous physical activity that promotes cardiorespiratory fitness ≥ 3 days/week for ≥ 20 minutes per occasion.

(1.5) Reduce the proportion of those who engage in no leisure-time physical activity to 15% of people aged 6 and older, (1.5a) 22% of people aged 65 and older, (1.5b) 20% of people with disabilities, (1.5c) 17% of lower-income adults, and (1.5d) 20% of black adults. Data related to these objectives were derived from MAQ-A and MAQ responses of zero leisure time physical activity.

(1.8) Increase to at least 50% the proportion of youths in 1st-12th grade who participate in daily school physical education. For adolescents data from the MAQ-A was based on this question: "How many days per week are you in PE class?"

Table 2. Healthy People 2000 target objectives and current reported frequencies of survey respondents

Healthy People 2000 Objective	Survey respondents		HP 2000 target ^a
	n	%	%
Overweight (adults only)		% overweight	
1.2 Men age 20 years and older	260	48	20
1.2 Women age 20 years and older	709	58	20
1.2a Low income (< \$20,000/year) women	252	67	25
1.2b Black women	336	72	30
1.2e Men with disabilities	28	50	25
1.2e Women with disabilities	61	82	25
1.2f Women with high blood pressure	232	71	41
1.2g Men with high blood pressure	261	48	35
Light to moderate physical activity		% respondents	
1.3 Adolescents (8 th grade) ^b	985	26	30
Vigorous physical activity			
1.4 Adolescents (8 th grade) ^b	988	37	75
1.4 All adults	1063	11	20
1.4a Low income adults	359	6	12
1.4b Black adults	488	8	17
No leisure-time physical activity			
1.5 Adults & adolescents (8 th grade) ^b	1831	15*	15
1.5a 65 years and older	318	31	22
1.5b Disabled adults	105	51	20
1.5c Low income adults	351	25	17
1.5d Black adults	489	24 [†]	20
Daily school physical education			
1.8 Adolescents (8 th grade) ^b	985	45 [†]	50

^aHealthy People 2000 target for each objective

^bData from the MAQ-A (all other data from the Household Survey MAQ)

*Reported frequencies of respondents exceeded Healthy People 2000 targets

[†]Reported frequencies of respondents within 20% of the Healthy People 2000 targets

Results

Demographics of the adult and youth study populations are shown in Table 1. Nearly three-fourths of surveyed adults were women, and there were slightly more white than black respondents. Approximately 21% of the adults reported less than 12th grade education, and 44% reported a family income less than \$20,000. There were slightly more females than males, and more black than white respondents among the 8th grade students. About 7% of these students were of other races, mainly Hispanic (4%).

Table 2 shows the results from the regional surveys, and the Healthy People 2000 target for each objective. None of the overweight goals were met, and only one physical activity target was met—that to increase leisure time physical activity (1.5). However, estimates of vigorous physical activity for adults did not include “walking for exercise” because the pace

of walking is highly variable and, therefore, may not qualify as vigorous. Had we included “walking for exercise,” then the percent of adults who engaged in vigorous exercise would be 31%, the percent of low-income adults, 23%, and the percent of black adults, 24%—all of which meet the target percentages. Two other items—no leisure time physical activity for black adults (1.5d) and daily school physical education (1.8)—came close to meeting the Healthy People 2000 targets.

Discussion

Obesity and physical inactivity significantly increase morbidity and mortality among adults. We have described the patterns of overweight and physical activity in eastern North Carolina relative to the national objectives of Healthy People

2000. The limited achievement of target goals resembles the national data published in the recent Healthy People 2000 review (1999).¹⁷

Obesity in eastern North Carolina is a huge health problem. Our data show a higher percentage of overweight in the studied population compared to national data.¹⁷ The weight data in this study were self-reported, and therefore subject to error, but our respondents were, on average, 135% above the Healthy People 2000 target goals.

And, despite the numerous health and psychological benefits of participation in regular physical activity,² our recorded physical activity patterns were only slightly closer to target than overweight status. In terms of vigorous physical activity, our data show that the population studied averaged 50% below the Healthy People 2000 goals, and that older, disabled, low income, and black adults averaged 66% above the goals for “no leisure-time physical activity.”

Adolescents as well as adults had too little vigorous physical activity. In fact, the adolescents studied did not meet the target goals for light-to-moderate physical activity. This is alarming given the fact that our adolescent population consisted of 8th grade students who would be expected to have higher overall levels of activity than older adolescents.^{3,6} Including “walking for exercise” in the analyses for vigorous physical activity would have greatly raised the percentage of adults participating in vigorous physical activity, but this activity is difficult to categorize as either a vigorous or light-to-moderate activity. The CDC/ACSM guidelines recommend that adults accumulate 30 minutes or more of moderate-intensity physical activity on most (preferably all) days of the week.³ In the present study, 31% of adults participate in regular moderate-to-vigorous leisure time activity which is in agreement with a recent national study demonstrating that 32% of adults meet the CDC/ACSM guidelines.⁴

In contrast to the lower levels of vigorous activity, the adults and adolescents in our population met the goal for “no leisure-time physical activity”. It is at least somewhat reassuring that the impact of a sedentary lifestyle is being heard by the people of our communities. Still, certain subgroups (older, disabled, and low-income adults) were far from meeting the target goals, while the black population studied was within 20% of the target goal.

Addressing the overweight epidemic should be a priority for our state and region. Public education about the health risks associated with obesity and physical inactivity, and the advantages of healthy diet and weight loss practices, is paramount. We must emphasize continued development of school curriculums that include health, nutrition, and physical activity for students. Doctors need to place a greater emphasis on patient counseling and become familiar with the health care and community resources that can facilitate patient compliance and weight loss. We need more research funding, and we need to emphasize evaluating the effectiveness of weight loss programs. We should also consider

alternative programs using social or grass-roots organizations that may be effective in promoting weight loss.

It may be unrealistic to expect that the next decade will see significant improvement in rates of vigorous physical activity in our region, particularly given the burden of chronic disease among the people of eastern North Carolina. Despite this, we should continue to promote and expect enough improvement in physical activity to provide cardiovascular and other health benefits. We must continue to reduce the percent of people reporting “no leisure-time physical activity.” The *promotion* of physical activity, however, is easier than actually *achieving* higher participation rates. We need continued public health efforts to encourage physical activity and educate the public. Positive legislative efforts like the Governor’s Council on Physical Fitness and Health have encouraged grass roots efforts to promote physical activity. Continued support for school and civic programs is also important in reaching the population. As with the overweight epidemic, doctors need to counsel their patients and consider partnerships with local health clubs, wellness centers, universities, and civic or religious organizations to provide reasonable and effective strategies to increase physical activity levels.

The importance of role models for physical activity should also be emphasized at all levels. This may occur through sports participation, activity groups (dance clubs, walking groups, water aerobics, etc), physician participation in local fun runs/walks or a wellness center, and through family activities such as daily walks or bicycling.

Eastern North Carolina is doing no better than the nation as a whole in decreasing overweight status or improving physical activity levels. Continued efforts are needed to improve in both of these areas. Given that these two conditions cost the nation billions of dollars in health care annually, we need even more to reduce this burden and improve the health of our people.

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