

Cancer prevention guidelines are associated with lower cancer risk in low-income and African American populations

Cancer is a major public health burden as an estimated 1,685,210 new cancer cases will be diagnosed in the United States in 2016. In general, African Americans and Americans with low socioeconomic status tend to have higher rates of cancer. The American Cancer Society publishes behavioral guidelines for individuals to adopt in order to decrease their cancer risk. These guidelines include standards on body weight, physical activity, nutrition, alcohol, and tobacco use. The impact of these guidelines has been rarely studied in low-socioeconomic status and African American populations.

American Cancer Society Guideline	Health Behavior	Study Definition For Meeting Guideline
Nutrition and Physical Activity for Cancer Prevention Achieve and maintain a healthy weight throughout life.	BMI (kg/m ²)	Met: BMI at study recruitment between 18.5-24.9 Did not meet: BMI at study recruitment less than 18.5 or greater than or equal to 25.0
Adopt a physically active lifestyle.	Physical activity via sports and exercise	Met: Participant reported at least 150 min/week of moderate activity, at least 75 min/week of vigorous activity, or greater than or equal to 150 min/week of moderate and vigorous activity combined Did not meet: Participant reported less physical activity than the recommendation stated above
Consume a healthy diet, with an emphasis on plant foods.	Diet quality	Met: Participants that met at least 2 of the 3 American Cancer Society sub-guidelines on diet quality related to consumption of grains, red and processed meats, and fruits and vegetables Did not meet: Participants that met 1 or fewer American Cancer Society sub-guidelines on diet quality
If you drink alcoholic beverages, limit consumption.	Alcohol consumption	Met: No or moderate alcohol intake, defined as less than or equal to 1 drink/day for women or 2 drink/day for men Did not meet: Heavy alcohol consumption, defined as greater than 1 drink/day for women or 2 drink/day for men
"Stay away from tobacco."	Smoking status	Met: Never smoker at study recruitment Did not meet: Former or current smoker at study recruitment

^aAmerican Cancer Society guidelines can be found at: www.cancer.org and in Kushi et al.(1). BMI is the abbreviation for body mass index.

Table. Study definitions for meeting the American Cancer Society Guidelines on Nutrition and Physical Activity for Cancer Prevention and Nonsmoking ^a.

In this study, we used information from 61,098 adults that participated in an epidemiological study named the Southern Community Cohort Study. The majority of participants were African American and/or had low household income. At recruitment, all participants provided the study investigators with information on their body weight, smoking status, dietary intake, alcohol intake, and regular physical activity. We evaluated whether meeting the American Cancer Society's guidelines for smoking, physical activity and diet were related to lower cancer risk. We also evaluated the association between cancer risk and a healthy lifestyle variable we created as the sum of the

number of American Cancer Society guidelines the participant met for body weight, physical activity, diet, and alcohol intake. The Table displays how we defined if participants met the American Cancer Society guidelines.

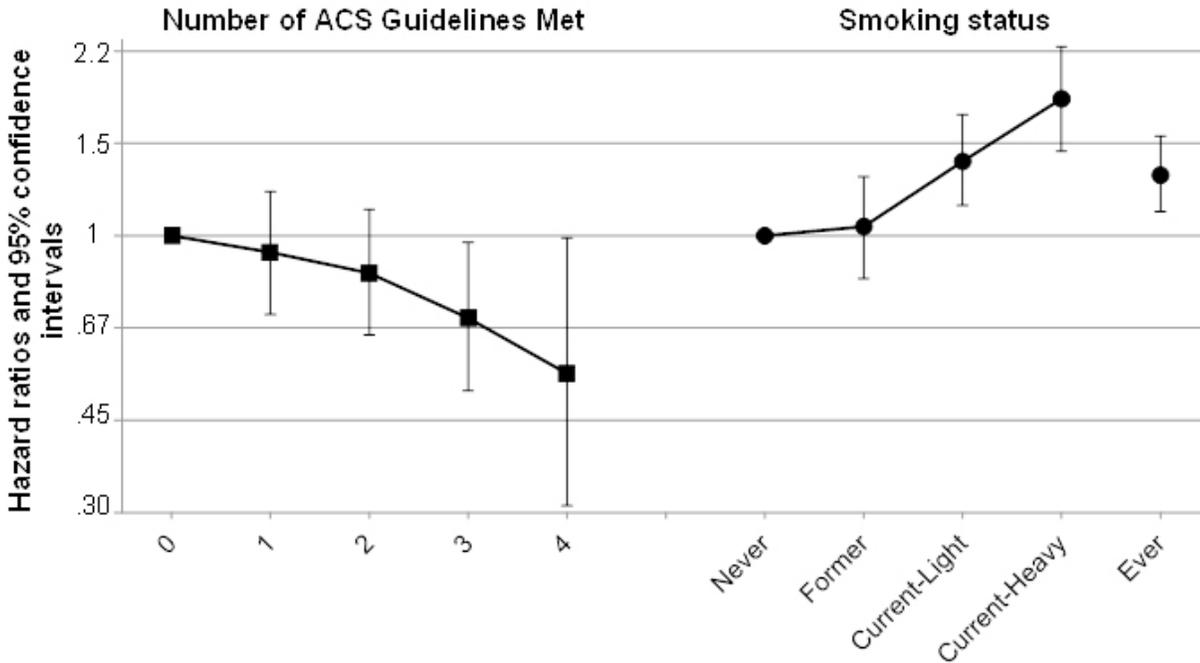


Fig. The associations between smoking status, American Cancer Society Guidelines on Nutrition and Physical Activity for Cancer Prevention healthy lifestyle score and cancer incidence among participants without chronic disease at baseline.

Hazard ratios and 95% confidence intervals are presented for the associations between cancer incidence and smoking status or the number of American Cancer Society guidelines met for body mass index, physical activity, diet, and alcohol intake. The Figure displays the inverse association between the healthy lifestyle score and cancer incidence, whereas increasing smoking history is associated with increased cancer risk.

Light current smoking is defined as smoking for less than 20 years or less than 20 cigarettes/day. Heavy current smoking is defined as smoking at least 20 cigarettes/day for greater than or equal to 20 years. ACS is the abbreviation for American Cancer Society.

After a median of 6 years, 2,240 participants were diagnosed with an incident cancer. Lower cancer risk was found among never smokers. Because some participants may have changed their health behaviors after a diagnosis of certain chronic diseases, we restricted our primary analysis to the 25,509 participants who did not have chronic diseases at recruitment. The healthy lifestyle variable was inversely associated with cancer risk. Participants who met one, two, three, or four

guidelines were at a respective 7%, 15%, 30%, and 45% decreased cancer risk in comparisons to participants that met no guidelines (details presented in Figure). The relationship between the healthy lifestyle score and cancer risk was consistent in analyses restricted to men, women, whites, African Americans, current smokers, never and former smokers, or participants with household incomes less than or greater than \$15,000.

Our study shows that low-socioeconomic status adults and African Americans who maintain a healthy lifestyle, measured by body weight, physical activity, diet, and alcohol intake are at lower cancer incidence. Public health campaigns and societal interventions are warranted to make adherence to American Cancer Society and other health guidelines easier.

Shaneda Warren Andersen, Wei Zheng

*Division of Epidemiology, Department of Medicine, Vanderbilt Epidemiology Center,
Vanderbilt-Ingram Cancer Center, Vanderbilt University School of Medicine, Nashville, TN, USA*

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Warren Andersen S, Blot WJ, Shu XO, Sonderman JS, Steinwandel MD, Hargreaves MK, Zheng W

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