



Published in final edited form as:

J Acad Nutr Diet. 2012 November ; 112(11): 1852–1858. doi:10.1016/j.jand.2012.06.357.

The Cardiovascular Health of Urban African-Americans: Dietary Results from the Genes, Nutrition, Exercise, Wellness and Spiritual Growth (GoodNEWS) Trial

Jo Ann S. Carson, PhD, RD, LD,

Professor and Program Director, Department of Clinical Nutrition, University of Texas Southwestern Medical Center, 5323 Harry Hines Blvd. Dallas, TX 75390-8877, Phone: 214-648-1522 (office); 214-282-0559 (cell); 214-648-1514 (FAX)

Linda Michalsky, PhD, RD, LD,

Assistant Professor, Department of Clinical Nutrition and Center for Human Nutrition, University of Texas Southwestern Medical Center, 5323 Harry Hines Blvd., Dallas, TX 75390-8877, Phone: 214-648-3045 (office); 214-648-1514 (FAX)

Bernadette Latson, MS, RD, LD,

Assistant Professor, Department of Clinical Nutrition, University of Texas Southwestern Medical Center, 5323 Harry Hines Blvd. Dallas, TX 75390-8877, Phone: 214-648-1524 (office); 214-648-1514 (FAX)

Kamakki Banks, MD,

Postdoctoral Trainee Clinician, Department of Internal Medicine, University of Texas Southwestern Medical Center, 5323 Harry Hines Blvd. Dallas, TX 75390-, Phone: 214-645-7521, FAX: 214-645-7501

Liyue Tong, MS,

Biostatistical Consultant, Department of Clinical Sciences, University of Texas Southwestern Medical Center, 5323 Harry Hines Blvd. Dallas, TX 75390-, Phone: 214-648-2810, FAX: 214-648-7673

Nora Gimpel, MD,

Assistant Professor, Department of Family and Community Medicine, University of Texas Southwestern Medical Center, 5323 Harry Hines Blvd. Dallas, TX 75390, Phone: 214-648-0768, FAX: 214-648-3708

Jenny J. Lee, MS, PhD, MPH, and

Columbus State University, 4225 University Avenue Columbus, Georgia 31907

Mark J. DeHaven, PhD

Professor, Texas Prevention Institute, University of North Texas Health Science Center, 3500 Camp Bowie Blvd. Fort Worth, Texas 76107, 817-735-5194, FAX: 817-735-0398

Jo Ann S. Carson: Joann.carson@utsouthwestern.edu

© 2012 Academy of Nutrition and Dietetics. Published by Elsevier Inc. All rights reserved.

at the time of the work: Professor, Department of Clinical Sciences University of Texas Southwestern Medical Center

Clinical Trial Registration: Unique Identifier NCT00669630; available at: <http://clinicaltrials.gov/ct2/show/NCT00669630?term=GoodNEWS&rank=1>

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Abstract

African-Americans have a higher incidence of cardiovascular disease (CVD) than Americans in general and are thus prime targets for efforts to reduce CVD risk. Dietary intake data were obtained from African-Americans participating in the GoodNEWS trial. The 286 females and 71 males had a mean age of 49 years; 53% had hypertension, 65% had dyslipidemia and 51% met criteria for metabolic syndrome. Their dietary intakes were compared to American Heart Association and National Heart Lung and Blood Institute nutritional parameters to identify areas for improvement to reduce CVD risk in this group of urban church members in Dallas, Texas. Results from administration of the Dietary History Questionnaire (DHQ) indicated median daily intakes of 33.6 % of energy from total fat, 10.3% of energy from saturated fat, 171 mg cholesterol, 16.3 g dietary fiber, and 2453 mg sodium. A beneficial median intake of 2.9 cups of fruits and vegetable/day was coupled with only 2.7 oz fish/week and an excessive intake of 13 tsp added sugar/day. These data indicate several changes needed to bring the diets of these individuals, and likely many other urban African-Americans, in line with national recommendations: reduction of saturated fat, sodium and sugar intake, while increasing intake of fatty fish and whole grains. The frequent inclusion of vegetables should be encouraged in ways that promote achievement of recommended intakes of energy, fat, fiber and sodium.

key words or descriptive phrases

diet; nutrition; cardiovascular diseases; risk factors

Introduction

Cardiovascular disease (CVD) is the leading cause of death in the United States (US). African-Americans have a higher incidence of CVD and higher rates of CVD mortality than Americans in general (1). Despite progress in CVD prevention and treatment, higher CV mortality among blacks continues (2). The American Heart Association (AHA), the National Heart, Lung and Blood Institute (NHLBI) and the Academy of Nutrition and Dietetics concur that dietary improvements can reduce CVD risk (3–5). AHA efforts to improve cardiovascular health by 20% and reduce cardiovascular mortality by 20% include tracking diet with five heart healthy dietary components (6).

The diet of African-Americans is high in total and saturated fat (7,8). Most African-Americans do not eat the recommended 4.5 cups of fruits and vegetables daily (9–12). Assessing the extent to which the diets of African-Americans meet current guidelines will identify areas for improvements to reduce CVD.

The objective of this paper is to compare the baseline dietary intakes of a convenience sample of African-Americans in the church-based Genes, Nutrition, Exercise, Wellness, and Spiritual Growth (GoodNEWS) trial with NHLBI and AHA nutritional recommendations. Nutrient and food intake important in CVD, including saturated fat, dietary fiber, sodium, fish and added sugar, are compared to national recommendations to identify improvements needed to achieve a heart healthy diet for urban, church-going African-Americans in Dallas, Texas and other similar populations in the US. Use of the National Cancer Institute's Dietary History Questionnaire (DHQ) with an African American population is described.

Methods

The GoodNEWS Trial

The GoodNEWS project is a community-based participatory research (CBPR) clinical trial to reduce CVD risk factors among African-Americans. As a CBPR study, this project

actively involved community members in all project components. The GoodNEWS concept began in 2003 as a partnership between investigators and church pastors. A 2005 pilot study trained the first GoodNEWS lay health promoters (LHPs) in 12 congregations. The investigators and congregational representatives participated on the GoodNEWS Advisory Board that developed this study, assisted with data interpretation and guided program content.

Recruitment, measurement and intervention have been described elsewhere (13). Twenty African-American congregations were recruited from the southern portion of Dallas, Texas, an area with the largest concentration of poverty, female-headed households and unemployed males in the city. Pastors of congregations of 100 to 11,000 members nominated two LHPs per congregation. Project staff trained the 20 LHP teams who then recruited a convenience sample of church members to participate. Inclusion/exclusion criteria included adults (18 years or older), membership in one of the participating churches, and willingness to participate in the study.

Data Collection

On one of two Saturday and two Wednesday mornings during September, 2008, participants arrived at a centrally located mega-church for clinical measurements. At the measurement event they rotated through rooms designated for blood pressure, anthropometric measures, blood samples, dietary intake and physical activity report. Participants completed an informed consent approved by the University of Texas Southwestern Medical Center Institutional Review Board.

Dietary Intake—Diet was assessed using the DHQ (14), a 36-page, 144-item cognitively based food frequency questionnaire (FFQ) that includes frequency and portion size questions (15,16). The dietetic staff included three registered dietitians from a coordinated program faculty and 22 of their students who participated in 90 minutes of DHQ training. Written directions for the staff and participants and supervision by the same dietitians provided consistency in data collection.

The dietetic staff reviewed the written DHQ instructions with each participant, instructing them to reflect intake from the last 12 months, illustrating portion sizes with food models. Participants selected their seats at tables and completed the DHQ in approximately 45 to 60 minutes. The staff answered questions and reviewed questionnaires for completeness, clarity and consistency. If participant behavior indicated any difficulty with the survey, staff offered to read them the questionnaire. An additional room was available for the 5% who completed it verbally.

After optical scanning of completed DHQs, nutrient and food group intake data were generated using the Diet*Calc software (version 1.4.3, 2005, National Cancer Institute Applied Research Program, Bethesda, MD). The results were compared with the Third Adult Treatment Panel's (ATP III) Therapeutic Lifestyle Changes (4) and the AHA heart healthy dietary components (6).

Other measures—Without shoes, height was measured using a stadiometer and weight was measured in light clothing using a Health-O-Meter 320 KL scale (Health-O-Meter, Bridgeview, Illinois). Body mass index (BMI), waist circumference, blood pressure and metabolic syndrome were determined using NHLBI procedures (4,17,18). Waist circumference was measured at a line horizontal to the floor at the height of the iliac crest. Blood pressure was measured twice after five minutes of seated rest. Fasting capillary blood was tested for lipids, glucose and HbA1c using the Cholestech LDX (Inverness Medical Innovations, Waltham, MA, USA) for the lipid and glucose levels and the DCA Vantage

Analyzer (Siemens Healthcare Diagnostics, Inc., Tarrytown, NY) for HbA1c. The coefficients of variation for blood tests ranged from 1.8% to 6.3%. A written questionnaire captured demographic data and CVD risk factors. Interviewers assessed physical activity using the 7-day Physical Activity Report (19).

Statistical Methods

Descriptive statistics were generated using Statistical Analysis Software (version 9.2, SAS Institute, Inc. Cary, NC) to produce mean intakes with standard deviations, median intakes and distribution curves. Data were excluded for participants whose energy intakes were beyond 95% of the population studied, resulting in exclusion of energy intakes >5,250 kcal/day. Intakes are presented as median intakes with 25th and 75th percentiles.

Results

Subjects

DHQs were distributed to 392 participants (including LHPs); one participant withdrew from the study; ten were excluded due to incomplete or implausible responses (e.g., identical responses to each item); 20 were excluded based on energy intake >5,250 kcal/day. Table 1 summarizes demographic and CVD risk data on 75 males and 286 females. The typical participant was an obese, middle-aged female with some post secondary education. Using NHLBI standards (18,4), approximately half of the group had hypertension and 65% had dyslipidemia (4). Clinical parameters in Table 1 include values of participants on medications to lower blood pressure (37%), serum lipids (23%) and glucose. The majority of participants had abdominal obesity (76%) and metabolic syndrome (51%).

Nutrient Intake

The median intakes of nutrients of interest in preventing CVD are compared with the NHLBI recommendations in Table 2. Saturated fat, trans fat and sodium intake exceeded recommended levels. The median dietary fiber intake of 16.3 g/day was below the recommended 20–30 g/day range. Only one in ten participants met the saturated fat recommendation and even fewer consumed <1% of energy from trans fat. Recommendations for total fat, cholesterol, fiber, and sodium were met by 40% to 60% of participants.

Table 3 compares GoodNEWS dietary intake with AHA components of a healthy diet. Although the majority of participants consumed >5 servings of fruits and vegetables daily, the mean intake of 2.9 cups/day is below the AHA recommended 4.5 cups/day. The majority did not meet recommendations for fish, whole grains or sodium. The median added sugar intake of 13 tsp/day suggests the majority of participants consumed less than the mean 2003–2006 National Health and Nutrition Examination Survey (NHANES) intake of 20 tsp/day (20), but substantially exceeded the AHA limitation of added sugar as half of allowed discretionary calories (21).

Discussion

Nutritional Issues

With a majority of obese participants with metabolic syndrome, the GoodNEWS cohort can benefit from improved lifestyle habits to reduce CVD risk. They should reduce saturated fat, trans fat, sodium and added sugar, while increasing moderate physical activity. Comparing the nutritional intake of the GoodNEWS participants with recommended intakes and other reports provides several observations.

Energy Intake—The median energy intake at a modest 1578 kcal/day is inconsistent with the prevalence of obesity. Possible explanations include underreporting and weight loss attempts.

Underreporting commonly occurs with FFQs. Energy intakes are lower when portion sizes are not assessed (15,22,23). Even with portion sizes included in the DHQ, energy intake was well below total energy expenditure based on a doubly-labeled water study (24).

Underreporting appears more common among whites than blacks, but similar among males and females (24,27). Increasing age and obesity diminishes accuracy (24). Consistent with the use of FFQ rather than recall, the median GoodNEWS energy intakes of both genders were markedly below the 2,085 kcal/day obtained by dietary recall from adult African-Americans in NHANES (26).

The lack of weight history data in the GoodNEWS cohort precluded interpretation of energy intake using weight changes. Comparison of energy intake to estimated energy expenditure (EEE) found <10% of females and of males had an energy intake within 10% of the EEE determined by the Mifflin St Jeor equation (27) with an activity factor based on PAR data (28). A greater proportion of overweight or obese participants reported energy intake <90% of EEE when compared to those with a normal weight, but this difference was not significant ($p=.09$ by Chi Square).

The authors considered excluding values viewed as implausible energy intake by other investigators (15,22,29,30). Dietitian review concluded the very high and low intakes could be plausible as they linked to individuals with extreme obesity or older adults on limited incomes. On the recommendation of the statistician, values from those reporting energy intakes outside 95% of the population were excluded (>5250 kcal/day), similar to the methodology used by Signorello (30) with a group of African-Americans. Before and after this exclusion, median intake values were similar, except for initial higher added sugar among men.

Given the prevalence of obesity in this cohort, sources of excess calories from added sugar, fat and alcohol should be considered. These church members reported very little alcohol intake; dietary fat intake was at the high end of the ATP III recommended range, and added sugar exceeded the AHA recommendation. A review of DHQ responses suggested that reduction of sweetened tea and regular soda consumption could substantially decrease intake of added sugar and calories.

Dietary Fat Intake—The GoodNEWS intake of saturated and trans fat was well above the recommended <7% of energy from saturated fat and <1% from trans fat. The GoodNEWS intake of approximately 10% saturated fat is similar to reports of other US blacks, including: 10% of energy from saturated fat among 9,559 men in the REGARDS cohort (31), 12% among the 199 obese women in the ORBIT trial (8), and 11% among the 89 blacks in the OMNI trial (32).

The GoodNEWS trans fat intake may be lower than reported due to the challenge of keeping nutrient databases current as industry lowers trans fat in the US food supply. However, with an estimated trans fat intake of 2.2% of energy intake, it is unlikely that GoodNEWS participants are achieving the AHA goal of <1% of energy. The black men in REGARDS consumed 2.9% of energy from trans fat; this slightly higher value may reflect use of the 1998 Block FFQ (31), as contrasted with the more recent 2007 DHQ (14) used for GoodNEWS.

Although of interest for CVD, assessment of omega-3 fatty acids was limited; the DHQ has only three items on fish: canned tuna, fried fish, and non-fried fish and seafood. Less than 20% took omega-3 supplements. Interaction with GoodNEWS participants indicated they could increase their omega-3 intake by substituting salmon patties and tuna entrees for their catfish and tilapia selections.

Dietary Fiber Intake—The median dietary fiber intake (16.3 g/day) of GoodNEWS participants is below the recommended range, but similar or greater than other groups, including 2007–2008 NHANES with a mean intake for African-Americans of 13.1 g/day (26). The mean GoodNEWS fiber intake of 10.3 g/1,000 kcal is similar to the 8.7 g fiber/1,000 kcal in ORBIT (8) and 10.1 g/1,000 calories in the OMNI trial (32). The GoodNEWS value reflects intake from both food and supplements. Only 20% of the participants reported using fiber supplements; mean fiber intake was 22.8 g/day for fiber supplement users and 20.8 g/day for the non-users.

Consuming only one of the recommended three oz of whole grains daily, many GoodNEWS participants obtained fiber primarily from fruits and vegetables. DHQ responses suggested that consuming 1 cup cooked greens/day contributed valuable amounts of fiber. Although a number of southern vegetables, such as greens, black-eyed peas and okra provide substantial fiber, saturated fat and sodium are frequently added via seasoning with salt pork or bacon. Thus, encouraging intake of these nutritious vegetables should include preparation tips.

Fruits and Vegetables Intake—Given frequent reports of the low intake of fruits and vegetables of Americans, it was surprising that the majority of GoodNEWS participants reported consuming >5 servings of fruits and vegetables/day. The Behavioral Risk Factor Surveillance System indicated that only 23% of black Texans meet this recommendation (33). Other FFQ studies have reported daily fruit and vegetable intake as: 3.5 servings among black church women in North Carolina (7), 4.7 servings among black women in Chicago (8), 3.5 servings among blacks in Detroit and Atlanta (11) and 3.1 servings among black men in New York City (12). Reported fruit and vegetable intake may be artificially increased with more items in a FFQ (22,34). Among a faith-based group of African-Americans, daily fruit and vegetable intake was 3.9 servings using a 2 item questionnaire, but 5.2 servings using a 17 item FFQ (34). The 40 fruit and vegetable items in the DHQ may have increased reported intake. When converted to cups of fruits and vegetables, the median GoodNEWS intake did not meet the AHA recommended 4.5 cups/day.

Strengths and Limitations

The strengths of this study include use of a validated, detailed instrument to assess dietary intake in 361 urban African-Americans, use of a CBPR approach and the consistency with of nutritional intake with other reports of African-Americans adults using various methodologies. It offers experience in use of the DHQ with an ethnic group underrepresented in the original validation study (15).

As a CBPR project, the pastors and LHPs were instrumental in reaching participants who are less likely to participate in university-based studies. The CBPR format included dissemination of the nutritional data at quarterly advisory board meetings and to church congregations. This allowed further interpretation of the data and identification of change strategies. For example, LHPs discussed how to deal with donuts (high in added sugar and trans fat) frequently served at church events.

A limitation of this study is that self-reported dietary intake is less accurate than biomarkers. (For instance, urinary sodium is a better marker of sodium intake than self-reported intake.)

Although the DHQ includes newer low-fat choices, seasonal intake of fruits and vegetables and cultural food items, such as “pork neckbones, hock, head and feet,” the DHQ was developed for Americans in general, not specifically African-Americans (14). Its development and validation did include 10% and 14% African-Americans (14,16). The GoodNEWS participants appeared to understand the DHQ items and were able to reflect foods they ate. In an item by item comparison of DHQ items and foods from recalls of rural Southern African-Americans (9) the GoodNEWS investigators concluded the DHQ offers a feasible means of reporting intake of foods typical of the southern African-American diet.

This group of urban, church-going African-Americans may not fully represent African-Americans across the South or blacks across the nation. This was a convenience sample, but recruitment by peers, allowing weekend or weekday participation and transportation provided by church members appears to have yielded a group representative of those likely to participate in community disease prevention interventions.

Future Research

A further step in investigating the diets of African-Americans and CVD risk would be to ascertain differences in dietary intakes of those with and without metabolic syndrome. Next, a randomized weight control intervention for African Americans with metabolic syndrome using CBPR to recruit and retain participants could offer an intervention tailored to community members.

Future studies should include weight history and diet history. Definition and exclusion of implausible energy intakes from FFQ results should be examined carefully with consideration of cases of extreme obesity and food insecurity.

Development of community nutrition interventions for groups of African-Americans similar to the GoodNEWS group should provide tips and demonstrations on simple to prepare, low cost meals and ways to reduce added sugar. Advice to this and similar groups should address

- selection of lower fat meat in place of bacon, barbeque ribs and chicken wings
- inclusion of fatty fish weekly
- embracing cultural vegetables high in antioxidants and fiber, but preparing them without added animal fat or excessive sodium
- preparation of foods at home and/or making wise selections at fast food restaurants.

Participants also need accurate nutrition information. Some participants voiced their mistaken view that poultry was always healthier than red meat (i.e., chicken wings are healthier than a hamburger).

Use of the DHQ in the African-American population should be studied further. The DHQ includes foods from the traditional southern African-American diet. Use of the DHQ allows comparison across other studies using the DHQ. A concern is the time and concentration required for completion. In retrospect, participants could review the DHQ and complete the first two pages at the time of informed consent; completed DHQs could be reviewed at the measurement event. The advisory board’s guidance to use paper questionnaires rather than computer-based items was appropriate. Future research could use dietary recalls to assess the validity of the DHQ and more recent African-American FFQs (22,30) in the same set of African-Americans. Further validation with the Hispanic population living in the US is also advised.

Conclusion

With careful planning and assistance, use of the DHQ was feasible in this population of urban African-American church members in Dallas, Texas. Dietary intake from this cohort exceeded the recommended intakes of saturated fat, trans fat, and added sugar. Their intakes of sodium and dietary fiber approached NHLBI recommendations, but were well below AHA sodium and whole grain criteria. Although they appear to eat > 5 servings of fruits and vegetables daily, they do not meet the AHA level of 4.5 cups/day. Community interventions to promote the health of groups similar to the GoodNEWS cohort can utilize these findings in development of programs to promote heart health and weight loss.

References

1. Roger VL, Go AS, Lloyd-Jones DM, et al. on behalf of the American Heart Association Heart Disease and Stroke Statistics Writing Group. Heart disease and stroke statistics--2011 update: A report from the American Heart Association. *Circulation*. 2011; 123(4):e18–e209. [PubMed: 21160056]
2. Keppel KG, Percy JN, Heron MP. Is there progress toward eliminating racial/ethnic disparities in the leading causes of death? *Public Health Rep*. 2010; 125(5):689–697. [PubMed: 20873285]
3. Lichtenstein AH, Appel LJ, Brands M, et al. American Heart Association Nutrition Committee . Diet and lifestyle recommendations revision 2006: A scientific statement from the American Heart Association nutrition committee. *Circulation*. 2006; 114(1):82–96. [PubMed: 16785338]
4. National Cholesterol Education Program Expert Panel on Detection, Evaluation and Treatment of High Blood Cholesterol in Adults. Executive summary of the third report of the National Cholesterol Education Program (NCEP) expert panel on detection, evaluation, and treatment of high blood cholesterol in adults. (Adult Treatment Panel III). *JAMA*. 2001; 285(19):2486–2497. [PubMed: 11368702]
5. Van Horn L, McCoin M, Kris-Etherton PM, et al. The evidence for dietary prevention and treatment of cardiovascular disease. *J Am Diet Assoc*. 2008; 108(2):287–331. [PubMed: 18237578]
6. Lloyd-Jones DM, Hong Y, Labarthe D, et al. for the American Heart Association Strategic Planning Task Force and Statistics Committee. Defining and setting national goals for cardiovascular health promotion and disease reduction: The American Heart Association's strategic impact goal through 2020 and beyond. *Circulation*. 2010; 121(4):586–613. [PubMed: 20089546]
7. Kim KH, Linnan L, Campbell MK, Brooks C, Koenig HG, Wiesen C. The WORD (Wholeness, Oneness, Righteousness, Deliverance): A faith-based weight-loss program utilizing a community-based participatory research approach. *Health Educ Behav*. 2008; 35(5):634–650. [PubMed: 17200103]
8. Fitzgibbon ML, Stolley M, Schiffer L, et al. Obesity Reduction Black Intervention Trial (ORBIT): design and baseline characteristics. *J Womens Health (Larchmt)*. 2008; 17(7):1099–1110. [PubMed: 18774895]
9. Bovell-Benjamin A, Dawkins N, Pace R, Shikany JM. Dietary consumption practices and cancer risk in African Americans in the rural south. *J Health Care Poor Underserved*. 2010; 21(3 Suppl): 57–75. [PubMed: 20675946]
10. Gans KM, Risica PM, Kirtania U, et al. Dietary behaviors and portion sizes of black women who enrolled in SisterTalk and variation by demographic characteristics. *J Nutr Educ Behav*. 2009; 41(1):32–40. [PubMed: 19161918]
11. Resnicow K, Davis R, Zhang N, et al. Tailoring a fruit and vegetable intervention on ethnic identity: results of a randomized study. *Health Psychol*. 2009; 28(4):394–403. [PubMed: 19594262]
12. Wolf RL, Lepore SJ, Vandergrift JL, et al. Knowledge, barriers, and stage of change as correlates of fruit and vegetable consumption among urban and mostly immigrant black men. *J Am Diet Assoc*. 2008; 108(8):1315–1322. [PubMed: 18656571]
13. Dehaven MJ, Ramos-Roman MA, Gimpel N, et al. The GoodNEWS (Genes, Nutrition, Exercise, Wellness, and Spiritual growth) Trial: A community-based participatory research (CBPR) trial

- with African-American church congregations for reducing cardiovascular disease risk factors - recruitment, measurement, and randomization. *Cont Clin Trials*. 2011; 32(5):630–640.
14. National Institutes of Health. Diet History Questionnaire, Version 1.0. National Cancer Institute; Applied Research Program.
 15. Subar AF, Thompson FE, Kipnis V, et al. Comparative validation of the Block, Willett, and National Cancer Institute food frequency questionnaires : the eating at America's table study. *Am J Epidemiol*. 2001; 154(12):1089–1099. [PubMed: 11744511]
 16. Thomson FE, Subar AF, Brown CC, et al. Cognitive research enhances accuracy of food frequency questionnaire reports: results of an experimental validation study. *J Am Diet Assoc*. 2002; 102(2): 212–218. 223–225. [PubMed: 11846115]
 17. National Heart, Lung and Blood Institute Obesity Education Initiative Expert Panel. The Evidence Report. Bethesda, Md: US Department of Health and Human Services; 1998. Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults. NIH publication 98–4038
 18. US Department of Health and Human Services. National Institute of Health. [Accessed August 3, 2009] Seventh report of the Joint National Committee on the Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7). Available at <http://www.nhlbi.nih.gov/guidelines/hypertension>
 19. Blair SN, Haskell WL, Ho P, et al. Assessment of habitual physical activity by a seven-day recall in a community survey and controlled experiments. *Am J Epidemiol*. 1985; 122(5):794–804. [PubMed: 3876763]
 20. Marriott BP, Olsho L, Hadden L, Connor P. Intake of added sugars and selected nutrients in the United States, National Health and Nutrition Examination Survey (NHANES) 2003–2006. *Crit Rev Food Sci Nutr*. 2010; 50(3):228–258. [PubMed: 20301013]
 21. Johnson RK, Appel LJ, Brands M, et al. for the American Heart Association Nutrition Committee of the Council on Nutrition, Physical Activity, and Metabolism and the Council on Epidemiology and Prevention. Dietary sugars intake and cardiovascular health: a scientific statement from the American Heart Association. *Circulation*. 2009; 120(11):1011–1020. [PubMed: 19704096]
 22. Carithers TC, Talegawkar SA, Rowser ML, et al. Validity and calibration of food frequency questionnaires used with African-American adults in the Jackson Heart Study. *J Am Diet Assoc*. 2009; 109(7):1184–1193. [PubMed: 19559135]
 23. Millen AE, Toozé JA, Subar AF, Kahle LL, Schatzkin A, Krebs-Smith SM. Differences between food group reports of low-energy reporters and non-low-energy reporters on a food frequency questionnaire. *J Am Diet Assoc*. 2009; 109(7):1194–1203. [PubMed: 19559136]
 24. Arab L, Tseng C, Ang A, Jardack P. Validity of a multipass, web-based, 24-hour self-administered recall for assessment of total energy intake in blacks and whites. *Am J Epidemiol*. 2011; 174(11): 1256–1265.
 25. Subar AF, Kipnis V, Troiano RP, et al. Using intake biomarkers to evaluate the extent of dietary misreporting in a large sample of adults: The OPEN study. *Am J Epidemiol*. 2003; 158(1):1–13. [PubMed: 12835280]
 26. USDA Agriculture Research Service. [Accessed December 17, 2010] What We Eat in America, NHANES. 2007–2008. Available at: <http://www.ars.usda.gov/Services/docs.htm?docid=18349>
 27. Mifflin MD, St Jeor ST, Hill LA, Scott BJ, Daugherty SA, Koh YO. A new predictive equation for resting energy expenditure in healthy individuals. *Am J Clin Nutr*. 1990; 51(2):241–247. [PubMed: 2305711]
 28. American Dietetic Association. [Accessed January 31, 2012] Calculator for Estimated Energy Expenditure, Nutrition Care Manual. Available at: http://www.nutritioncaremanual.org/calculators.cfm?ncm_category_id=10
 29. Williams CD, Satia JA, Adair LS, et al. Dietary patterns, food groups, and rectal cancer risk in whites and African-Americans. *Cancer Epidemiol Biomarkers Prev*. 2009; 18(5):1552–1561. [PubMed: 19423533]
 30. Signorello LG, Munro HM, Buchowski MS, Schlundt DG, Cohen SS, Hargreaves MK, Blot WJ. Estimating nutrient intake from a food frequency questionnaire: incorporating the elements of race and geographic region. *Am J Epidemiol*. 2009; 170(1):104–111. [PubMed: 19451177]

31. Newby PK, Noel SE, Grant R, Judd S, Shikany JM, Ard J. Race and region are associated with nutrient intakes among black and white men in the United States. *J Nutr.* 2011; 141(2):296–303. [PubMed: 21178088]
32. Furtado JD, Campos H, Sumner AE, Appel LJ, Carey VJ, Sacks FM. Dietary interventions that lower lipoproteins containing apolipoprotein C-III are more effective in whites than in blacks: results of the OmniHeart trial. *Am J Clin Nutr.* 2010; 92(4):714–722. [PubMed: 20826623]
33. National Center for Chronic Disease Prevention and Health Promotion, Behavioral Risk Factor Surveillance System. [Accessed January 31, 2012] Prevalence and Trends Data: Texas—2009, Fruits and Vegetables. Available at: <http://apps.nccd.cdc.gov/BRFSS/race.asp?cat=FV&yr=2009&qkey=4415&state=TX>
34. Resnicow K, Campbell MK, Carr C, et al. Body and Soul. A dietary intervention conducted through African-American churches. *Am J Prev Med.* 2004; 27(2):97–105. African-American Dietary Results from the Genes, Nutrition, Exercise, Wellness and Spiritual Growth (GoodNEWS) Trial. [PubMed: 15261895]

\$watermark-text

\$watermark-text

\$watermark-text

Table 1

Demographic Characteristics and Cardiovascular Risk Factors of Subjects

Characteristic	Total (n=361)	Males (n=75)	Females (n=286)
Age (yrs) ^a	49.1±11.9	47.9±11.5	49.5±12.1
Education beyond high school ^{b, c}	267 (75.4%)	49 (65.3%)	218 (78.1%)
Married ^{b,d}	187 (50.8%)	59 (78.7%)	128 (45.2%)
Non-smokers ^{b,e}	243 (75.9%)	42 (62.7%)	201 (79.4%)
Physical Activity ^{f,g}			
light activity	175 (50.0%)	25 (36.8%)	150 (53.2%)
moderate activity	119 (34.0%)	23 (33.8%)	96 (34.0%)
vigorous activity	56 (16.0%)	20 (29.4%)	36 (12.8%)
Body Mass Index (kg/m ²) ^a	34.0±8.2	34.8±7.7	33.8±8.4
Weight Classification ^{b,h}			
normal weight	51 (14.1%)	9 (12.0%)	42 (14.7%)
Overweight	69 (19.1%)	15 (20.0%)	54 (18.9%)
obese (classes I-III)	241 (66.8%)	51 (68.0%)	190 (66.4%)
Waist Circumference (cm) ^{a,h}	105±17.6	106.4±16.8	104.7±17.8
Blood Pressure (mmHg) ^{a,j}			
systolic	126.7±19.7	125±15.8	127.2±20.6
diastolic	79.5±10.2	80.3±10.7	79.2±10.1
Total Cholesterol (mg/dL) ^{a,k}	179.3±43.9	184.6±53.6	177.9±41.0
LDL-Cholesterol (mg/dL) ^{a,k}	109.7±40.9	111.1±53.1	109.4±37.1
HDL-Cholesterol (mg/dL) ^{a,k}	47.9±16.1	48.5±17.4	47.7±15.8
Triglycerides (mg/dL) ^{a,l}	123.5±83.9	155.4±126.5	115.1±66.2
Fasting Glucose (mg/dL) ^{a,m}	101.9±37.1	106.4±55.6	100.7±30.5
hbA1C (%) ^a	6.2± 1.2	6.2± 1.6	6.1± 1.1
Metabolic Syndrome ^{b,n}	185 (51.2%)	29 (38.7%)	156 (54.5%)

^a mean values are provided for continuous variables with standard deviations

^b reported as number of subjects with percentage in parentheses

^c missing education data on 7 females

^d missing marital status data on 3 females

^e missing smoking status on 8 males and 33 females

^f assessed using the 7-Day Physical Activity Recall Instrument (21)

^g missing physical activity data on 7 males and 4 females

^h elevated waist circumference defined by NHLBI is >88 cm for women and >102 cm in men

^j normal blood pressure defined by JNC 7 is <120/<80

^k to convert mg/dL cholesterol to mmol/L, multiply mg/dL by 0.026; cholesterol of 179.3 mg/dL =4.66 mmol/L.

^l to convert mg/dL of triglyceride to mmol/L multiply by 0.0113; triglyceride of 123.5 mg/dL =1.40 mmol/L.

^m to convert mg/dL of glucose to mmol/L multiply by 0.0555; glucose of 101.9=5.56 mmol/L

ⁿ defined by National Heart Lung and Blood Institute criteria (4).

\$watermark-text

\$watermark-text

\$watermark-text

Table 2

Comparison of Median GoodNEWS and NHLBI Recommendations

Nutritional Parameter	Recommended Level	GoodNEWS Median Daily Intake (25 th , 75 th %ile)		
		All Subjects (n=361)	Male (n=75)	Female (n=286)
Energy Intake (kcal)		1578 (1083, 2461)	1637 (1183, 2377)	1574 (1078, 2512)
Total Fat (% energy)	25% to 35%	33.6 (28.7, 38.3)	35.1 (30.5, 39.2)	33.0 (28.1, 38.0)
Saturated Fat (% of energy)	<7%	10.3 (8.5, 11.8)	10.8 (9.8, 11.9)	10.1 (8.2, 11.8)
Trans Fat (% of energy)	<1% ^a	2.1 (1.7, 2.7)	2.2 (1.8, 2.7)	2.1 (1.6, 2.7)
Dietary cholesterol (mg)	<200	171 (99, 271)	191 (105, 296)	163 (96, 266)
Dietary fiber (g)	20–30	16.3 (10.6, 24.8)	16.1 (9.6, 22.6)	16.5 (11.1, 25.4)
Sodium (mg)	2400 ^b	2453 (1649, 3722)	2632 (1768, 3749)	2399 (1567, 3618)

^aNHLBI recommendation is to keep trans fat as low as possible; AHA recommendation is <1% of energy.

^bOther NHLBI values are ATP III Therapeutic Lifestyle Change recommendations; 2400 mg sodium daily is recommended in the NHLBI 7th Report of the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure.

Table 3

Comparison of GoodNEWS Intake with AHA Healthy Diet Components

Food Category	AHA Healthy Diet Components (3)	Median GoodNEWS intake/day (25 th , 75 th %ile)		
		All Participants	Male (n=75)	Female (n=286)
Fruits and vegetables (cups/day)	4.5	2.9 (1.5, 4.9)	2.2 (1.2, 4.0)	3.0 (1.5, 5.3)
Fish, preferably oily (oz/wk)	7	2.7 (1.3, 5.0)	2.6 (1.2, 5.0)	2.7 (1.3, 5.1)
Fiber-rich whole grains (1 oz servings/day)	3	1.0 (0.6, 1.7)	0.9 (0.6, 1.8)	1.0 (0.6, 1.7)
Sodium (mg/day)	<1500	2453 (1649, 3733)	2632 (1768, 3749)	2399 (1567, 3618)
Added sugar (tsp/wk) ^a	56	92 (53,164)	88 (47,180)	92 (52,154)

^aIn place of the AHA metric of 450 kcal/week of sugar-sweetened beverages, the available GoodNEWS analysis allowed comparison on the basis of total daily sugar. The value 56 tsp/wk was derived based on the AHA's allowance of half of the added sugar recommendation allowed from beverages (6).