Published in final edited form as:
J Natl Med Assoc. 2011 June ; 103(6): 503–512.

Prevalence Rates of Hypertension Self-care Activities Among African Americans

Dr Jan Warren-Findlow, PhD and
Department of Public Health Sciences, The University of North Carolina at Charlotte

Dr Rachel B. Seymour, PhD
Center for Research on Health and Aging, The University of Illinois at Chicago

Abstract

Background—A comprehensive understanding of the self-care activities that contribute to blood pressure control may explain health disparities experienced by African Americans with hypertension. This study assessed the prevalence of self-care activities among African Americans with high blood pressure and examined differences between adherers and nonadherers to self-care activities.

Methods—Interviews were conducted with 186 African Americans. Self-care activities were measured using the H-SCALE (Hypertension Self-Care Activity Level Effects), which was developed to assess the behavioral activities recommended for optimal management of high blood pressure.

Results—More than half of participants reported adhering to medication recommendations and prescribed physical activity levels (58.6% and 52.2%, respectively). Following practices related to weight management was less frequent, (30.1%) and adherence to low-salt diet recommendations was also low (22.0%). Three-fourths were nonsmokers and 65% abstained from alcohol. Across the self-care activities, adherers were more likely to be older and female. Nonadherers were more likely to be uninsured.

Conclusions—Many African Americans still face challenges related to hypertension self-care, particularly with weight management and salt reduction. The H-SCALE was a valid and reliable measure of hypertension self-care activities. In addition to monitoring blood pressure, health care providers should assess patients' hypertension self-care activities using the H-SCALE.

Keywords

hypertension; African Americans; prevention

INTRODUCTION

Approximately 29% of US adults have high blood pressure, and this figure increases with age.[1] African Americans have substantially higher prevalence of hypertension than whites (45.2% vs 29.1%).[2] Only half of adults in the United States with hypertension have their blood pressure controlled (systolic blood pressure <140 mm Hg and diastolic blood pressure <90 mm Hg).[1] Recent findings suggest that African Americans are 27% less likely to have their blood pressure controlled than whites (odds ratio, 0.73; 95% confidence interval,

correspondence: Jan Warren-Findlow, PhD, Assistant Professor, Department of Public Health Sciences, The University of North Carolina at Charlotte, 9201 University City Blvd, Charlotte, NC 28223 (jwarren1@uncc.edu)..

Note: For instructions, scoring, and the complete version of the H-SCALE, please contact the corresponding author.

0.64-0.83), but other studies find no differences between blacks and whites.[1,3] Recent trends indicate that hypertension awareness, treatment, and control are improving for African Americans and the US population in general.[1] Studies examining control of blood pressure frequently adjust for participants' clinical risk factors such as diabetes and cardiovascular disease and for treatment with medication but less frequently assess what activities individuals engage in to help manage their blood pressure such as medication adherence, or diet and exercise practices.

Self-care activities are critical to the management of blood pressure, as recommended by the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC7).[4] Multiple randomized control trial interventions have demonstrated the positive effects of self-care behaviors on treating and managing high blood pressure.[5] However, few community-based assessments have been conducted as to what hypertension self-care activities are being undertaken by individuals who have high blood pressure.[6,7]

The purpose of this study was to field a new self-report measure to assess hypertension self-care activities recommended by the medical community for optimal control of blood pressure. This measure, the Hypertension Self-Care Activity Level Effects (H-SCALE), assesses the 6 prescribed self-care activities recommended by the JNC7: adherence to medication, weight loss or maintenance of ideal body weight, adoption of a low-salt diet, regular physical activity for 30 minutes most days of the week, limiting alcohol intake, and ceasing tobacco use. The H-SCALE was designed specifically for use in primary care settings and in large-scale, epidemiological surveys. Here, we report on the H-SCALE and its items, the reliability of the measure, the prevalence rates of hypertensive self-care, and differences between adherers and nonadherers to H-SCALE activities in a sample of African Americans with hypertension in North Carolina.

BACKGROUND

The importance of chronic illness self-care in improving individual health outcomes related to chronic disease has been well documented.[8,9] Unfortunately, adherence to chronic illness self-care regimens is poor, particularly among minority populations.[10-12] Poor knowledge, cultural beliefs and practices, influence of family members, perceived barriers, socioeconomic factors, and other issues have been shown to affect African Americans' self-care activities for hypertension and thus their ability to manage blood pressure.[11,13-16] Having uncontrolled hypertension may contribute significantly to the health disparities experienced by African Americans in relation to kidney disease, renal failure, dialysis, and stroke as well as other cardiovascular disease complications.[17,18]

The primary treatment for high blood pressure is hypertensive drug therapy; however, medication alone, even when patient adherence is high, has frequently not proved sufficient to manage chronic disease.[19] In a population-based survey of hypertensive adults and their self-care activities, those individuals who reported taking medication without engaging in dietary changes or physical activity had no higher rates of controlled disease than those who were committed to diet and exercise but who reported less adherence to medication.[7] Weir et al concluded that a hypertension behavior assessment instrument is needed to aid health care providers in assisting patients to manage high blood pressure.[7] This paper describes the development and testing of such a measure.

Scale Development Process

The H-SCALE assesses the self-care practices related to hypertension as outlined in the JNC7 (Table 1). We constructed this self-care measure following the format of an existing validated scale, the Summary of Diabetes Self-Care Assessment.[20,21] Diabetes management

requires individuals to perform a similar set of self-care activities as is needed for hypertension management. We modified items relating to medication usage, physical activity, and smoking to be specific to hypertension. Importantly, we assess levels of self-care by asking the number of days per week that an individual performs the self-care activity. These response categories were chosen specifically to enable hypertension researchers to explore a dose-response relationship between the various hypertension self-care activities and blood pressure, to ultimately determine the relative contribution of each activity to blood pressure management.

For dietary practices, several items were developed to assess adherence to daily activities related to reducing salt intake and eating healthier foods. The H-SCALE diet items ask about specific salty foods to avoid, cooking techniques, and food substitutions. A separate group of items was created to assess weight management activities within a 30-day time frame. The 30-day time frame was selected because many weight management activities do not occur on a daily basis (eg, grocery shopping or eating out). Items in this domain were adapted from the booklet *Aim for a Healthy Weight*.[22] Activities that individuals perform in an effort to "watch their weight" or to specifically lose weight are meaningfully different from those related to a low-salt/sodium diet. Thus, persons with chronic diseases need to be assessed about the specific activities they perform to maintain their weight or lose weight, such as reducing portion sizes and/or avoiding situations where overeating is common. Alcohol intake was assessed using an existing measure, the 3-item, National Institute on Alcohol Abuse and Alcoholism Quantity and Frequency Questionnaire.[23]

Following an expert panel review, a pilot study was conducted using the H-SCALE with a convenience sample of adults with hypertension (n = 44). All activity domains had acceptable reliability: medication usage (α = .93), physical activity (α = .82), eating a low-salt diet (α = .71), and weight management (α = .90). The resulting scale contains 31 items to assess the 6 hypertension self-care activities (Table 1). Based on the pilot study results, a larger community-based study was conducted. Those findings are presented here.

METHODS

Design

This cross-sectional study was conducted from August 2008 through spring 2010. Data were collected from African American family members residing in the greater Charlotte, North Carolina, metropolitan area. Approximately one-third of Charlotte residents are African American.[24] Rates of hypertension among African Americans in Charlotte are considerably greater than rates for the state[25] as a whole (36.4% vs 22.4%).

Participants

The sample consisted of 186 African Americans diagnosed with hypertension. Eligible participants were African American, aged at least 21 years old, had been diagnosed with high blood pressure for at least 6 months, and had been prescribed hypertensive medication. Hypertension diagnosis was confirmed through a medication inventory. Participants were recruited through the Caring for Hypertension in African American Families study, which examined hypertension self-care practices among African American families. Participants were recruited through partnership with the local chapter of the American Heart Association/American Stroke Association, community-based organizations, low-income health care clinics, black churches, barber shops, mass e-mails to African Americans employed at a public university, letters to previous research participants, word of mouth from study participants, and other community events such as health fairs. All participants

completed an informed consent process approved by the University of North Carolina, Charlotte institutional review board.

Trained African American interviewers collected data in face-to-face sessions at the participant's preferred location (92% were in his or her home or the home of a relative also participating in the study). Interviewers were 2 undergraduate students majoring in public health who were trained on all study protocols and interview techniques before entering the field. Interviews lasted an average of 58 minutes. Each participant received a $20 gift card to a local grocery or large retail store.

Measures and Scoring

The outcome measures were the 6 self-care activities encompassed in the H-SCALE.

Medication adherence—Three items assessed the number of days in the last week that an individual: (1) takes blood pressure medication, (2) takes it at the same time every day, and (3) takes the recommended dosage. Responses were summed (range, 0-21), and participants reporting that they followed these 3 recommendations on 7 out of 7 days were considered adherent (score = 21).

Low-salt diet—Twelve items assessed practices related to eating a healthy diet, avoiding salt while cooking and eating, and avoiding foods high in salt content. Nine items were negatively phrased; these items were reverse coded. A mean score was calculated. Scores of 6 or better (indicating that participants followed low-salt diet practices on 6 out of 7 days) were considered adherent.

Physical activity—Physical activity was assessed by 2 items. "How many of the past 7 days did you do at least 30 minutes total of physical activity?" and "how many of the past 7 days did you do a specific exercise activity (such as swimming, walking, or biking) other than what you do around the house or as part of your work?" Responses were summed (range, 0-14). Participants who scored an 8 or better were coded as adhering to physical activity recommendations; all others were nonadherent. This designation was chosen to ensure that participants had to report some combination of both physical activity and exercise in order to be considered adherent.

Smoking—Smoking status was assessed with 1 item, "How many of the past 7 days did you smoke a cigarette or cigar, even just one puff?" Respondents who reported 0 days were considered a nonsmoker. All others were categorized as smokers.

Weight management—These 10 items assess activities undertaken to manage weight through dietary practices such as reducing portion size and making food substitutions as well as exercising to lose weight. Items assessed agreement with weight management activities during the past 30 days. Response categories ranged from strongly disagree (1) to strongly agree (5). Responses were summed creating a range of scores from 10 to 50. Participants who reported that they agreed or strongly agreed with all 10 items (score ≥40) were considered to be following good weight management practices.

Alcohol—Alcohol intake was assessed using an existing measure, the 3-item, National Institute on Alcohol Abuse and Alcoholism Quantity and Frequency Questionnaire.[23] For these analyses, adherence to JNC7 recommendations was deemed to be alcohol abstinent. Participants who reported not drinking any alcohol in the last 7 days or who indicated that they usually did not drink at all were considered abstainers. All others were nonadherent.

Independent variables consisted of demographic and health characteristics. Demographic variables included age, gender, marital status, and living alone. Socioeconomic factors were assessed by home ownership, household income (≤$10 000, $10 000-$50 000, and ≥$50 000), and education (high school degree or less, some college or a 2-year degree, or a ≥4-year degree).

We also included several important health characteristics that may influence hypertension self-care. Self-rating of health was assessed with responses ranging from excellent to poor. Participants who reported good to excellent health were coded with a 1 and all others were a 0. Participants also reported in years how long since they were initially diagnosed with hypertension. Body mass index (BMI) was calculated from self-reported weight and height. BMI was categorized as normal weight, overweight, obese, and extremely obese using conventional criteria.[26] We also assessed whether participants currently had health insurance coverage.

Analyses

Data were entered into SPSS version 16.0 for analysis. Statistical procedures were performed to test the psychometric properties of the H-SCALE. Internal consistency of items for each subscale was examined using a Cronbach α. A Cronbach alpha greater than 0.70 is generally considered to indicate acceptable reliability; an α greater than .85 indicates good reliability. Fit statistics were calculated for each activity measure in order to test how well the hypothesized group of items performed as a measure of the activity domain; values of greater than 0.95 are considered to be acceptable and an indicator of fit to the model.[27]

Descriptive statistics (frequencies, means, and standard deviations) were calculated for demographic and health characteristics and to assess participants' adherence to the self-care activities. Differences between self-care adherers and nonadherers on demographics and other health-related characteristics were conducted using *t* tests and cross tabulations. The χ^2 statistic was used to determine statistically significant differences between adherers and nonadherers on variables with more than 2 categories. The Pearson χ^2 statistic was used for dichotomous variables. Results are reported as percentages for categorical variables or means with standard deviations for continuous variables (age and years with hypertension). Significance was set at $\alpha \leq 0.05$.

RESULTS

Demographic and health-related characteristics of the sample (n = 186) are shown in Table 2. Participants ranged in age from 22 to 88 years and were predominantly female. One-fourth had a 4-year college degree or better. A large percentage had taken some college courses or had a 2-year degree (39.8%). One-third earned $50 000 or more in income. In terms of health, most rated their health as good to excellent (76.9%), despite having lived with hypertension for a mean of approximately 14 years. One-fifth were normal weight; one-third were overweight, and the rest were obese based on BMI. Approximately 11% of participants did not have health care insurance.

All self-care domains had acceptable to good Cronbach α's, indicating that the scale is consistent and reproducible for use with community-based populations: medication (0.84), low-salt diet (0.74), weight management (0.87), and alcohol use (0.88). Fit statistics were calculated for the 4 of the 6 activity domains that contained more than 2 items. The fit statistic values were above 0.95 for the medication, weight management, and alcohol domains indicating that the items as a group were a good measure of that activity; the fit statistics were below the acceptable level for the low-salt diet domain.

The prevalence rates of individual hypertension self-care activities are shown in Table 3. More than half of the sample (58.6%) reported being adherent to hypertension medication protocols. Less than one-fourth were following a low-salt diet on most days of the week. More than half (52.2%) were engaging in physical activity and some exercise on most days of the week. Three-fourths were non-smokers. Only 30% of participants followed good weight management practices. Two-thirds abstained from drinking any alcohol.

In bivariate analyses, we compared adherers and nonadherers on demographic and health-related characteristics (Tables 4 and 5). Individuals who adhered to medication protocols differed significantly from those who reported not adhering on multiple characteristics. Medication adherers were more likely to be older (mean age, 55.8 vs 49.0 years), and a larger proportion of adherers were women (78.9% vs 61.0%). Nonadherent participants were more likely to be uninsured (17.7% vs 6.3%) as compared to those who adhered to medication regimens. Adherers and nonadherers did not differ on socioeconomic factors such as home ownership, education, or income.

Participants who adhered to low-salt diet practices had greater mean years with hypertension (17.3) than nonadherers (11.5). The only differentiating factor for physical activity adherence was related to health insurance status. Participants who reported engaging in physical activity were significantly more likely to be uninsured (16.5%) as compared to those who were not physically active (5.6%).

Nonsmokers were older, more likely to be women, and own their home (Table 5). Education levels differed between smokers and nonsmokers. Each additional level of education had a lower percentage of smokers, and this was statistically significant. Participants who had been living with hypertension longer were more likely to be nonsmokers (mean, 13.8 vs 9.6 years). More than 3 times as many uninsured participants were smokers (23.4% vs 7.2%).

The only statistically significant factors that differentiated participants who practiced good weight management principles from those who did not were living alone (28.6% as compared to 15.4%) and owning one’s home (70.9% vs 45.3%).

Older participants (mean age, 57.2 vs 45.2 years) and those who were women (81.8% vs 52.3%) were more likely to abstain from alcohol. Alcohol abstainers had been living with hypertension longer than participants who drank alcohol (14.9 years as compared to 8.8 years). Those who drank alcohol were more likely than abstainers to have never married (27.7% vs 12.4%) and to be uninsured (23.1% vs 5.0%).

DISCUSSION

The H-SCALE survey instrument demonstrated good face validity and reliability for the 6 self-care activity domains for hypertension. In this sample of African American adults, the prevalence rates of recommended hypertension self-care activities were greater than 50% for behaviors related to medication adherence, physical activity, not smoking, and alcohol abstinence. Rates were much lower for self-care activities relating to following a low-salt diet and managing or losing weight.

Most participants were adherent to medication protocols on all days of the week. However, some reported 1 or 2 days per week where they consistently did not take their medication. Studies have indicated that African Americans are more likely to be prescribed diuretics and to complain of frequent urination as interfering with other activities.[10] Anecdotally, this explanation is consistent with conversations with these participants and other related studies with African Americans.[28] Only 5% of the sample were not taking medication at all even though it had been prescribed. The finding that older adults are more likely to be adherent to

blood pressure medication regimens is consistent with previous research.[29] Our finding that women were more likely to be adherent with medication regimens than men is inconsistent with other research.[30] However, this sample had relatively few male participants.

Slightly more than half the sample reported engaging in at least 30 minutes of physical activity plus doing some other specific forms of exercise. This rate is substantially higher than other activity rates reported in the literature for adults, and African American adults in particular.[31] While this finding is very positive, the criterion for activity that we have specified is still potentially less than what is recommended for individuals to lose weight.[32] In this sample, 75% of participants were over-weight or obese, yet weight status was unrelated to self-care activities. Losing just 5% to 10% of body weight can have a positive effect on blood pressure.[33] The latest research indicates that overweight and obesity in older adults is largely unmentioned by health care providers, suggesting that physicians may need to increase their communication with patients about their weight status.[34] Overweight African Americans are less likely to accurately perceive their weight status and overweight African American women underestimate their risk for chronic illness.[35,36]

Of concern is the low prevalence rate associated with eating a low-salt diet in this sample. Eating a low-salt diet is highly effective in reducing blood pressure and risk of stroke,[37] yet research with national samples indicates an overall decline in rates of adherence with low-salt diets among individuals with hypertension. This finding is especially notable among non-Hispanic blacks, who were 39% less likely than non-Hispanic whites to be following the DASH diet.[6] A recent study conducted with African Americans in North Carolina reported that many participants believed there were health benefits and few barriers to eating healthy but that only one-third were knowledgeable about foods that were high in salt content.[14] African Americans may need more specific instructions from their health care providers as to which processed foods to avoid and how to cut down on salt when cooking traditional foods.[38] Some caution must be exercised when interpreting this measure. The Cronbach α was 0.74, which is above the conventional cutoff of 0.70, indicating acceptable levels of reliability. However, the values for the fit indices were lower than desired. The sample had a very low prevalence of adherence to low-salt diet activities (22%), which may contribute to the poor fit. Further exploration at the item level and among subgroups is needed.

Rates of smoking in this sample were associated with socioeconomic status. Rates of smoking declined with greater levels of education, and nonsmokers were more likely to own their own home, a standard measure of wealth. Based on education, the participants in this study have a higher socioeconomic status than national averages for African Americans (approximately 26% have a bachelor's degree or higher as compared to 20% of African Americans in the United States).[39] In low-income African Americans, older age was a predictor of smoking, whereas older adults in our sample were less likely to smoke.[40] Again, this finding may reflect the higher education level of the participants. Education is important to assess when discussing smoking cessation with African Americans, as individuals with less education have greater difficulty quitting smoking. Thus, more attempts may be needed before achieving cessation.[41]

Following good weight management practices was more likely to occur among participants who lived alone. This result suggests that African Americans may find it difficult to sustain good self-care practices when residing among other family members, perhaps experiencing negative behavioral support from family members around these self-care activities.[16]

Findings indicate that this sample had high rates of alcohol abstinence, which is consistent with statewide statistics for African Americans in North Carolina.[42] Heavy alcohol intake

has been empirically linked to hypertension.[43] Moderate drinking as compared to abstinence has been associated with reduced risk for coronary artery disease and related mortality, but not among African Americans.[44] However, no recommendations exist to suggest that abstainers should begin drinking alcohol for health benefits, and it is unclear whether consumption of alcohol is appropriate for those with hypertension and taking medication. Alcohol abstinence in this sample may be related to the high level of religious participation associated with African Americans and with the study setting in the "Bible Belt" region in the southern United States.[45] Eighty percent of participants reported that they were currently a member of a black church (data not shown).

Lack of health insurance was related to nonadherence on 3 activities (medication, nonsmoking and alcohol use). Medication adherence is cost sensitive and those without health insurance are less likely to receive treatment.[46] Minority and urban populations who are uninsured are more likely to have uncontrolled blood pressure.[47] With respect to smoking and alcohol use, the uninsured may experience greater stress and manage that stress with smoking and alcohol use.[48] These issues are more difficult to address because individuals without insurance have fewer interactions with the health care system when behavioral counseling could be provided.

Strengths and Limitations

This study is the first to comprehensively assess JNC7 recommended hypertension self-care activities. Overall, the H-SCALE survey instrument was reliable and demonstrated preliminary validity with this sample of African Americans with hypertension. Importantly, the H-SCALE distinguishes between weight management practices and activities related to eating a low-salt diet. The format of the survey will facilitate future research on the relative contribution of each of these self-care activities towards blood pressure control, an area that is currently missing from the literature.

The study sample was diverse in terms of age and socioeconomic status. However, participants were primarily from an urban, southern city, and the findings from this study may not be applicable to African Americans from other geographic regions or rural areas.

This study was a cross-sectional design and thus causality cannot be determined. Participants self-selected to participate in the study. People who volunteer to be in research studies may be different from those who do not volunteer, which would bias the results. Participants were recruited from a wide variety of venues and locations in an effort to reduce that bias as much as possible. We did not verify participants' reports of a diagnosis of hypertension except by recording their hypertensive medications. We collected no clinical markers such as blood pressure or nutrient intakes so we cannot validate participants' reported self-care activities with objective measures, or with actual blood pressure control. There may be a response bias related to stigma in data collected about alcohol and tobacco use, which would result in an overestimate of the number of participants who are abstinent or nonsmokers. These participants may report higher levels of physical activity than the general population, as 16% of the sample was recruited from area YMCAs, where people were attending exercise classes and engaging in other activities.

CONCLUSION

Evidence exists for the positive influence of self-care activities on controlling blood pressure. Better adherence to self-care behaviors is one important way to close the gap on hypertension and stroke-related health disparities experienced by African Americans. This exploratory study provided evidence for a new survey instrument to assess hypertension self-care activities based on current clinical recommendations for hypertension management.

The measure was tested with a community-based sample of diverse African Americans. Future research will validate the H-SCALE activities with actual blood pressure to establish concurrent validity.

The H-SCALE is a short, simple-to-administer measure that can be used in clinical settings to provide useful information to health care providers about patients' self-care activities, thus creating opportunities for discussion and intervention. In particular, the H-SCALE offers clinicians a more nuanced understanding of patients' medication practices that may provide insight into patient issues with blood pressure control. Further the prevalence rates from this study suggest that primary care providers should focus their counseling efforts to help African American patients practice weight management techniques and follow a low-salt diet. Referrals to a dietician or nutritionist, when feasible, may improve adherence to these self-care activities. These findings suggest that health care providers may want to consider obtaining further information about self-care activities from patients with uncontrolled hypertension.

Acknowledgments

Funding/Support: Funding was provided by a grant (R03AG030523) from the National Institute on Aging.

REFERENCES

1. Egan BM, Zhao y, Axon RN. US Trends in prevalence, awareness, treatment, and control of hypertension, 1988-2008. JAMA. 2010; 303(20):2043–2050. [PubMed: 20501926]
2. Fryar CD, Hirsch R, Eberhardt MS, yoon SS, Wright JD. Hypertension, high serum total cholesterol, and diabetes: racial and ethnic prevalence differences in US adults, 1999-2006. NCHS Data Brief. Apr.2010 (36):1–8. [PubMed: 20423605]
3. Howard G, Prineas R, Moy C, Cushman M, et al. Racial and geographic differences in awareness, treatment, and control of hypertension: the Reasons for Geographic And Racial Differences in Stroke Study. Stroke. 2006; 37(5):1171–1178. [PubMed: 16556884]
4. US Department of Health and Human Services. The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. National Institutes of Health; 2004. Report No.: NIH Publication No. 04-5230
5. Dickinson HO, Mason JM, Nicolson DJ, Campbell F, et al. Lifestyle interventions to reduce raised blood pressure: a systematic review of randomized control trials. J Hypertens. 2006; 24:215–233. [PubMed: 16508562]
6. Mellen PB, Gao SK, Vitolins MZ, Goff DC Jr. Deteriorating dietary habits among adults with hypertension: DASH dietary accordance, NHANES 1988-1994 and 1999-2004. Arch Intern Med. 2008; 168(3):308–314. [PubMed: 18268173]
7. Weir MR, Maibach EW, Bakris GL, Black HR, et al. Implications of a health lifestyle and medication analysis for improving hypertension control. Arch Intern Med. 2000; 160(4):481–490. [PubMed: 10695688]
8. Goldman DP, Smith JP. Can patient self-management help explain the SES health gradient? Proc Natl Acad Sci U S A. 2002; 99:10929–10934. [PubMed: 12140364]
9. Lorig KR, Sobel DS, Stewart AL, Brown BWJ, et al. Evidence suggesting that a chronic disease self-management program can improve health status while reducing hospitalization: a randomized trial. Med Care. 1999; 37(1):5–14. [PubMed: 10413387]
10. Bosworth HB, Dudley T, Olsen MK, Voils CI, et al. Racial differences in blood pressure control: potential explanatory factors. Am J Med. 2006; 119(1):70.e9–70.e15. [PubMed: 16431192]
11. Ndumele CD, Shaykevich S, Williams D, Hicks LS. Disparities in adherence to hypertensive care in urban ambulatory settings. J Health Care Poor Underserved. 2010; 21:132–143. [PubMed: 20173260]

12. Oster NV, Welch V, Schild L, Gazmararian JA, Rask K, Spettell C. Differences in self-management behaviors and use of preventive services among diabetes management enrollees by race and ethnicity. Dis Manag. 2006; 9(3):167–175. [PubMed: 16764534]
13. Heurtin-Roberts S, Reisin E. The relation of culturally influenced lay models of hypertension to compliance with treatment. Am J Hypertens. 1992; 5(11):787–792. [PubMed: 1457078]
14. Pawlak R, Colby S. Benefits, barriers, self-efficacy and knowledge regarding healthy foods: perception of African Americans living in eastern North Carolina. Nutr Res Prac. 2009; 3(1):56–63.
15. Sallar AM, Williams PB, Omishakin AM, Lloyd DP. Stroke prevention: awareness of risk factors for stroke among African American residents in the Mississippi Delta Region. J Natl Med Assoc. 2010; 102(2):84–94. [PubMed: 20191920]
16. Warren-Findlow J, Prohaska TR. Families, social support, and self-care among older African-American women with chronic illness. Am J Health Promot. 2008; 22(5):342–349. [PubMed: 18517095]
17. Douglas JG, Bakris GL, Epstein M, Ferdinand KC, et al. Management of high blood pressure in African Americans: consensus statement of the Hypertension in African Americans Working Group of the International Society on Hypertension in Blacks. Arch Intern Med. 2003; 163(5): 525–541. [PubMed: 12622600]
18. Gu Q, Dillon CF, Burt VL, Gillum RF. Association of hypertension treatment and control with all-cause and cardiovascular disease mortality among US adults with hypertension. Am J Hypertens. 2010; 23(1):38–45. [PubMed: 19851295]
19. Svetkey LP, Harsha DW, Vollmer WM, Stevens VJ, et al. Premier: A clinical trial of comprehensive lifestyle modification for blood pressure control: rationale, design and baseline characteristics. Ann Epidemiol. 2003; 13:462–471. [PubMed: 12875806]
20. Toobert, DJ.; Glasgow, RE. Assessing diabetes self-management: The summary of diabetes self-care activities questionnaire. In: Bradley, C., editor. Handbook of psychology and diabetes. Harwood Academic; Chur, Switzerland: 1994. p. 351-375.
21. Toobert DJ, Hampson SE, Glasgow RE. The Summary of Diabetes Self-Care Activities measure: Results from 7 studies and a revised scale. Diabetes Care. 2000; 23(7):943–950. [PubMed: 10895844]
22. US Department of Health and Human Services, National Institutes of Health. Aim for a healthy weight. 2005. Report No.: NIH Publication No. 05-5213
23. National Institute on Alcohol Abuse and Alcoholism. The Physician's Guide to Helping Patients with Alcohol Problems. Washington, DC: NIH. Report No. 95-3769
24. US Census Bureau. [Accessed June 8, 2010] Charlotte, NC 2006-2008 American Community Survey 3-year Estimates. http://factfinder.census.gov/servlet/ACSSAFFFacts?_event=Search&geo_id=&_geoContext=&_street=&_county=charlotte&_cityTown=charlotte&_state=04000US37&_zip=&_lang=en&_sse=on&pctxt=fph&pgsl=010
25. CDC. REACH 2010 Surveillance for health status in minority communities—United States, 2001-2002. MMWR. 2004; 53(No. SS-6):1–40.
26. National Institutes of Health. Clinical guidelines on the identification, evaluation, and treatment of overweight and obesity in adults: the evidence report. Obes Res. 1998; 6(suppl 2):51s–209s. [PubMed: 9813653]
27. Lemeshko, By; Lemeshko, SB.; Postovalov, SN. Comparative analysis of the power of goodness-of-fit tests for near competing hypotheses: verification of complex hypotheses. J Appl Ind Math. 2010; 4(1):79–93.
28. Warren-Findlow J. Weathering: Stress and heart disease in African American women living in Chicago. Qual Health Res. 2006; 16(2):221–237. [PubMed: 16394211]
29. Hekler EB, Lambert J, Leventhal E, Leventhal H, Jahn E, Contrada RJ. Commonsense illness beliefs, adherence behaviors, and hypertension control among African Americans. J Behav Med. 2008; 31(5):391–400. [PubMed: 18618236]
30. Braverman J, Dedier J. Predictors of medication adherence for African American patients diagnosed with hypertension. Ethn Dis. 2009; 19(4):396–400. [PubMed: 20073139]

31. National Center for Health Statistics. Health, United States, 2009: With Special Feature on Medical Technology. Hyattsville, MD: 2010.
32. Donnelly JE, Blair SN, Jakicic JM, Manore MM, Rankin JW, Smith BK. Appropriate physical activity intervention strategies for weight loss and prevention of weight regain for adults. Med Sci Sports Exerc. 2009; 41(2):459–471. [PubMed: 19127177]
33. Stevens VJ, Obarzanek E, Cook NR, Lee IM, et al. Long-Term Weight Loss and Changes in Blood Pressure: Results of the Trials of Hypertension Prevention, Phase II. Ann Intern Med. 2001; 134(1):1–11. [PubMed: 11187414]
34. Clune A, Fischer JG, Lee JS, Reddy S, Johnson MA, Hausman DB. Prevalence and predictors of recommendations to lose weight in overweight and obese older adults in Georgia senior centers. Prev Med. 2010; 51(1):27–30. [PubMed: 20382178]
35. Bennett GG, Wolin Ky. Satisfied or unaware? Racial differences in perceived weight status. Int J Behav Nutr Phys Act. 2006; 3(40)
36. Moore SE, Harris C, Wimberly y. Perception of weight and threat to health. J Natl Med Assoc. 2010; 102(2):119–124. [PubMed: 20191924]
37. Bibbins-Domingo K, Chertow GM, Coxson PG, Moran A, et al. Projected effect of dietary salt reductions on future cardiovascular disease. N Engl J Med. 2010:1–10. e-pub.
38. Scisney-Matlock M, Bosworth HB, Giger JN, Strickland OL, et al. Strategies for implementing and sustaining therapeutic lifestyle changes as part of hypertension management in African Americans. Postgrad Med. 2009; 121(3):147–159. [PubMed: 19491553]
39. [Accessed June 5, 2010] Infoplease. African Americans by the Numbers. www.infoplease.com/spot/bhmcensus1.html
40. Lee D, Turner N, Burns J, Lee T. Tobacco use and low-income African Americans: policy implications. Addict Behav. 2007; 32(2):332–341. [PubMed: 16828978]
41. Piper ME, Cook JW, Schlam TR, Jorenby DE, et al. Gender, race, and education differences in abstinence rates among participants in two randomized smoking cessation trials. Nicotine Tob Res. 2010; 12(6):647–657. [PubMed: 20439385]
42. North Carolina State Center for Health Statistics. [Accessed June 3, 2010] 2008 BRFSS Survey Results: North Carolina. www.schs.state.nc.us/SCHS/brfss/2008/nc/afam/DRNKANy4.html
43. Klatsky AL. Alcohol and cardiovascular health. Physiol Behav. 2010; 100(1):76–81. [PubMed: 20045009]
44. Sempos CT, Rehm J, Wu T, Crespo CJ, Trevisan M. Average volume of alcohol consumption and all-cause mortality in African Americans: the NHEFS cohort. Alcohol Clin Exp Res. 2003; 27(1): 88–92. [PubMed: 12544011]
45. Hunt MO, Hunt LL. Regional religions?: Extending the “semi-involuntary” thesis of African-American religious participation. Sociol Forum. 2000; 15(4):569–594.
46. Duru OK, Vargas RB, Kermah D, Pan D, Norris KC. Health insurance status and hypertension monitoring and control in the United States. Am J Hypertens. 2007; 20(4):348–353. [PubMed: 17386339]
47. Wang TJ, Vasan RS. Epidemiology of uncontrolled hypertension in the United States. Circulation. 2005; 112(11):1651–1662. [PubMed: 16157784]
48. Ludman EJ, Curry SJ, Grothaus LC, Graham E, Stout J, Lozano P. Depressive symptoms, stress, and weight concerns among African American and European American low-income female smokers. Psychol Addict Behav. 2002; 16(1):68–71. [PubMed: 11934089]

Table 1

Hypertension—Self-care Activity Level Effects (H-SCALE) Items

Medication Usage
How many of the past 7 days did you:
1. Take your blood pressure pills?
2. Take your blood pressure pills at the same time every day?
3. Take the recommended number of blood pressure pills?
Low-salt Diet
How many of the past 7 days did you…
4. Follow a healthy eating plan?
5. Eat potato chips, salted nuts, or salted popcorn?
6. Eat processed meats such as ham, bacon, bologna, or sausage?
7. Eat smoked meats or smoked fish?
8. Eat pickles, olives, or other vegetables in brine?
9. Eat ≥5 servings of fruits and vegetables?
10. Eat frozen prepared dinners or frozen pizza?
11. Eat store bought or packaged bakery goods?
12. Salt your food at the table?
13. Add salt to food when you're cooking?
14. Eat fried foods such as chicken, french fries, or fish?
15. Avoid eating fatty foods?
Physical Activity
How many of the past 7 days did you…
16. Do at least 30 minutes total of physical activity?
17. Do a specific exercise activity (such as swimming, walking, or biking) other than what you do around the house or as part of your work?
Smoking
How many of the past 7 days did you…
18. Smoke a cigarette or cigar, even just one puff?
Weight Management
In order to lose weight or maintain my weight…
19. I am careful about what I eat.
20. I read food labels when I grocery shop.
21. I exercise in order to lose or maintain weight.
22. I have cut out drinking sugary sodas and sweet tea.
23. I eat smaller portions or eat fewer portions.
24. I have stopped buying or bringing unhealthy foods into my home.
25. I have cut out or limit some foods that I like but that are not good for me.
26. I eat at restaurants or fast food places less often.
27. I substitute healthier foods for things that I used to eat.
28. I have modified my recipes when I cook.

Medication Usage

Alcohol

A *drink* of alcohol is defined as: one 12-oz can or bottle of beer, one 4-oz glass of wine, one 12-oz can or bottle of wine cooler, 1 mixed drink or cocktail, or 1 shot of hard liquor.

29. On average, how many days per week do you drink alcohol?

30. On a typical day that you drink alcohol, how many drinks do you have?

31. What is the largest number of drinks that you've had on any given day within the last month?

Table 2

Demographic and Health Characteristics of Study Participants (n = 186)

	%
Age, y (mean, 52.98 SD ± 16.02)	
22-34	14.5
35-49	28.0
50-64	31.2
65-88	26.3
Gender	
Women	71.5
Men	28.5
Marital status	
Married	35.5
Never married	17.5
Divorced, separated, widowed	46.8
Live alone	
Yes	19.4
No	80.6
Own home	
Yes	53.0
No	47.0
Household income	
≤$10000	18.8
$10000-49999	47.3
≥$50000	33.9
Education	
High school degree, GED, or less	34.4
Some college or 2-year degree	39.8
4-year degree or above	25.8
Self-rated health	
Good to excellent self-rated health	76.9
Fair or poor self-rated health	23.1
Years with hypertension (mean, 12.76 SD ± 11.13)	
<10	46.8
≥10	53.2
Body mass index (BMI)	
Normal weight (BMI <25.0)	20.1
Overweight (BMI ≥25.0 but <30.0)	32.6
Obese (BMI ≥30.0 but <40.0)	35.3
Extremely obese (BMI ≥40.0)	12.0
Uninsured	
Yes	11.3

	%
No	88.7

Abbreviation: GED, General Education Development.

Table 3

H-SCALE Prevalence Rates (n = 186)

Self-care Activity	%
Medication adherence	58.6
Low-salt diet adherence	22.0
Physical activity	52.2
Nonsmoking	74.7
Weight management	30.1
Alcohol abstinence	65.1

Table 4

Differences Between Adherers and Nonadherers to Medication, Low-salt Diet, and Physical Activity Behaviors for Demographic and Health Characteristics[a]

	Medication Adherence		Low-Salt Diet		Physical Activity	
	Adherers (n = 109)	Non-adherers (n = 77)	Adherers (n = 41)	Non-adherers (n = 145)	Adherers (n = 97)	Non-adherers (n = 89)
Age, y (mean [SD])	55.8 (15.9)	49.0 (15.5)[b]	56.2 (17.0)	52.1 (15.7)	51.1 (15.9)	55.1 (16.0)
Gender						
Female	78.9	61.0[b]	82.9	68.3	72.2	70.8
Male	21.1	39.0	17.1	31.7	27.8	29.2
Marital status						
Married	36.7	33.8	29.3	37.2	34.0	37.1
Never married	14.7	21.1	14.6	18.6	19.6	15.7
Divorced, separated, widowed	48.6	44.2	56.1	44.1	46.4	47.2
Live alone						
Yes	23.9	13.0	29.3	16.6	19.6	19.1
No	76.1	87.0	70.7	83.4	80.4	80.9
Own home						
Yes	57.4	46.7	55.0	52.4	50.5	55.7
No	42.6	53.3	45.0	47.6	49.5	44.3
Household income						
<$10000	19.3	18.2	22.0	17.9	17.5	20.2
$10000-49999	45.0	50.6	41.5	49.0	51.5	42.7
≥$50000	35.8	31.2	36.6	33.1	30.9	37.1
Education						
High school or less	33.9	35.1	36.6	33.8	33.0	36.0
Some college or 2-year degree	36.7	44.2	31.7	42.1	41.2	38.2
4-year degree or better	29.4	20.8	31.7	24.1	25.8	25.8
Self-rated health						
Good to excellent	72.5	83.1	82.9	75.2	79.4	74.2

	Medication Adherence		Low-Salt Diet		Physical Activity	
	Adherers (n = 109)	**Non-adherers (n = 77)**	**Adherers (n = 41)**	**Non-adherers (n = 145)**	**Adherers (n = 97)**	**Non-adherers (n = 89)**
Fair or poor	27.5	16.9	17.1	24.8	20.6	25.8
Years with hypertension, mean (SD)	13.9 (12.1)	11.2 (9.5)	17.3 (13.9)	11.5 (9.9)[c]	11.5 (10.6)	14.1 (11.5)
Body mass index						
Normal weight (BMI <25)	25.2	13.0	19.5	20.3	18.9	21.3
Overweight (BMI ≥25 but <30)	28.0	39.0	36.6	31.5	29.5	36.0
Obese (BMI ≥30 but <40)	34.6	36.4	34.1	35.7	41.1	29.2
Extremely obese (BMI ≥40)	12.1	11.7	9.8	12.6	10.5	13.5
Uninsured						
Yes	6.4	18.2[c]	4.9	13.1	16.5	5.6[c]
No	93.6	81.8	95.1	86.9	83.5	94.4

[a] All values are percentages except where noted.

[b] Significant at $p < .01$.

[c] Significant at $p < .05$.

Table 5

Differences Between Adherers and Nonadherers to Nonsmoking, Weight Management Activities, and Alcohol Abstinence for Demographic and Health Characteristics[a]

	Nonsmoking		Weight Management		Alcohol Abstinence	
	Adherers (n = 139)	Non-adherers (n = 47)	Adherers (n = 56)	Non-adherers (n = 130)	Adherers (n = 121)	Non-adherers (n = 65)
Age, y (mean [SD])	54.9 (16.2)	47.3 (14.4)[b]	55.6 (16.5)	51.8 (15.7)	57.2 (15.7)	45.2 (13.7)[b]
Gender						
Female	75.5	59.6[c]	73.2	70.8	81.8	52.3[b]
Male	24.5	40.4	26.8	29.2	18.2	47.7
Marital status						
Married	36.7	31.9	39.3	33.8	37.2	32.3[c]
Never married	14.4	27.7	16.1	18.5	12.4	27.7
Divorced, separated, widowed	48.9	40.4	44.6	47.7	50.4	40.0
Live alone						
Yes	22.3	10.6	28.6	15.4[c]	19.8	18.5
No	77.7	89.4	71.4	84.6	80.2	81.5
Own home						
Yes	59.4	33.3[b]	70.9	45.3[b]	55.8	47.6
No	40.6	66.7	29.1	54.7	44.2	52.4
Household income						
<$10000	16.5	25.5	12.5	21.5	22.3	12.3
$10000-49999	48.9	42.6	46.4	47.7	45.5	50.8
≥$50000	34.5	31.9	41.1	30.8	32.2	36.9
Education						
High school or less	30.9	44.7[c]	28.6	36.9	38.0	27.7
Some college or 2-year degree	38.8	42.6	37.5	40.8	38.0	43.1
4-year degree or better	30.2	12.8	33.9	22.3	24.0	29.2
Self-rated health						

J Natl Med Assoc. Author manuscript; available in PMC 2012 July 05.

	Nonsmoking		Weight Management		Alcohol Abstinence	
	Adherers (n = 139)	Non-adherers (n = 47)	Adherers (n = 56)	Non-adherers (n = 130)	Adherers (n = 121)	Non-adherers (n = 65)
Good to excellent	79.1	70.2	80.4	75.4	73.6	83.1
Fair or poor	20.9	29.8	19.6	24.6	26.4	16.9
Years with hypertension, mean (SD)	13.8 (11.8)	9.6 (8.1)[b]	13.7 (11.7)	12.4 (10.9)	14.9 (11.7)	8.8 (8.7)[b]
Body mass index						
Normal weight (BMI <25)	19.7	21.3	23.6	18.6	18.5	23.1
Overweight (BMI ≥25 but <30)	30.7	38.3	32.7	32.6	29.4	38.5
Obese (BMI ≥30 but <40)	36.5	31.9	36.4	34.9	36.1	33.8
Extremely obese (BMI ≥40)	13.1	8.5	7.3	14.0	16.0	4.6
Uninsured						
Yes	7.2	23.4[b]	6.9	13.1	5.0	23.1[b]
No	92.8	76.6	93.1	86.9	95.0	76.9

[a] All values are percentages except where noted

[b] Significant at $p < .01$.

[c] Significant at $p < .05$.