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The Association Between Self-Efficacy and Hypertension Self-Care Activities Among African American Adults

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Abstract

Chronic disease management requires the individual to perform varying forms of self-care behaviors. Self-efficacy, a widely used psychosocial concept, is associated with the ability to manage chronic disease. In this study, we examine the association between self-efficacy to manage hypertension and six clinically prescribed hypertension self-care behaviors. We interviewed 190 African Americans with hypertension who resided in the greater metropolitan Charlotte area about their self-efficacy and their hypertension self-care activities. Logistic regression for correlated observations was used to model the relationship between self-efficacy and adherence to hypertension self-care behaviors. Since the hypertension self-care behavior outcomes were not rare occurrences, an odds ratio correction method was used to provide a more reliable measure of the prevalence ratio (PR). Over half (59%) of participants reported having good self-efficacy to manage their hypertension. Good self-efficacy was statistically significantly associated with increased prevalence of adherence to medication (PR = 1.23, 95% CI: 1.08, 1.32), eating a low-salt diet (PR = 1.64, 95% CI: 1.07–2.20), engaging in physical activity (PR = 1.27, 95% CI: 1.08–1.39), not smoking (PR = 1.10, 95% CI: 1.01–1.15), and practicing weight management techniques (PR = 1.63, 95% CI: 1.30–1.87). Hypertension self-efficacy is strongly associated with adherence to five of six prescribed self-care activities among African Americans with hypertension. Ensuring that African Americans feel confident that hypertension is a manageable condition and that they are knowledgeable about appropriate self-care behaviors are important factors in improving hypertension self-care and blood pressure control. Health practitioners should assess individuals' self-care activities and direct them toward practical techniques to help boost their confidence in managing their blood pressure.

Keywords

Adherence; Hypertension; Minorities; Self-efficacy; Self-management

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Introduction

Over 40% of adults aged 45–64 and over 70% of adults over age 65 have hypertension [1]. Current clinical policy, based on the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC7), recommends that people with hypertension engage in six self-care activities: adhering to antihypertensive medication regimens, maintaining or losing weight, following a low-salt diet, limiting alcohol, engaging in regular physical activity, and eliminating tobacco use [2]. The positive effects of these self-care behaviors on the treatment and management of high blood pressure have been demonstrated in randomized control trials [3]. However, rates of self-care engagement among hypertensive adults are relatively low [4–7].

Among African Americans, the prevalence of hypertension is significantly higher than among White Americans (45.2% versus 29.1%) [8]. African Americans are also less likely to have their blood pressure controlled than Whites [9]. Studies that examine factors that predict control of blood pressure frequently adjust for participants' clinical risk factors such as obesity, other chronic conditions and treatment with medication, but less frequently assess the self-care activities that individuals engage in to help manage their blood pressure. Poor adherence to self-care behaviors may explain in part the health disparities experienced by African Americans with respect to hypertension and its consequences.

Adherence to antihypertensive medications is lower among African Americans than among Whites [6, 10]. African Americans are frequently prescribed a more complex drug regimen than Whites, that requires them to take multiple medications [4]. They are more likely to complain of uncomfortable side effects from drugs such as diuretics, which may contribute to their low adherence [11]. African Americans are more likely than Whites to eat a high fat diet [12] and African American women have lower rates of engaging in physical activity than Whites [13], thus increasing the risk of obesity. Obesity is a risk factor for prehypertension and hypertension [14, 15]. Maintaining or losing weight can have a positive effect on blood pressure management however African Americans are less likely to achieve significant or lasting weight loss [16, 17]. Non-Hispanic Blacks with hypertension are 39% less likely than non-Hispanic Whites with hypertension to be following a low-salt diet, such as DASH (Dietary Approaches to Stop Hypertension) [5]. African Americans smoke cigarettes at approximately the same rate as Whites, but are significantly more likely to be exposed to secondhand smoke [18, 19]. Alcohol usage among African Americans can be described as encompassing opposite ends of the spectrum with a higher prevalence of total abstinence but among those who do drink alcohol, more reported occasions of binge drinking [20]. This constellation of health risk factors can make managing high blood pressure particularly challenging, both for African Americans with hypertension and for the health providers and practitioners working with them. Cumulatively, these multiple risk factors create the potential for even greater health disparities in relation to stroke, kidney disease, end stage renal disease, disability and death [21].

Helping individuals understand that hypertension is a manageable condition can increase their confidence about living with a chronic disease. Self-efficacy [22], or confidence in one's ability to participate in a given behavior, is a common element in programs designed to improve chronic illness self-management [23–25]. Self-efficacy has been associated with better chronic disease self-care among individuals managing asthma, diabetes, and arthritis [26, 27]. Within the context of chronic disease self-management, measures of self-efficacy have focused on illness-related domains such as managing pain and other symptoms, communicating with one's physician, obtaining health-related information, dealing with depression, and taking medication [28]. Additional studies have examined self-efficacy in

relation to other self-care behaviors, such as diet and exercise, but not necessarily within the chronic illness self-management context [25].

Among African Americans with hypertension, self-efficacy has been associated with self-report and objective measures of adherence to medication regimens [4, 29, 30] as well as participation in physical activity [31]. Further studies have found that self-efficacy has been demonstrated to be a predictor of African Americans' participation in other healthy behaviors such as following a recommended diet [32] and weight loss [33]. To date, however, no study has examined self-efficacy and its association with the cluster of self-care behaviors that are recommended for hypertension management. The purpose of this study is to examine the association between self-efficacy to manage hypertension and adherence to the current JNC7-recommended self-care behaviors among African Americans with hypertension. Findings from this study can be used to inform patient self-care interventions for African Americans with hypertension.

Methods

Study Design

The Caring for Hypertension in African American Families (CHAAF) study was a cross-sectional study conducted at the University of North Carolina at Charlotte (UNC Charlotte) from September 2008 to August 2010. The purpose of CHAAF was twofold: one, to assess chronic illness self-care behaviors among African American adults with hypertension [34]; and two, to examine psychosocial factors that influence self-care adherence among this population, in particular family influences [35].

Study Recruitment

Study staff recruited older parent-adult child pairs from the larger Charlotte, NC metropolitan community. We recruited through diverse outlets such as partnership with the local chapter of the American Heart Association/American Stroke Association, community-based organizations, low-income health care clinics, Black churches, and barber shops and hair salons. Several recruitment strategies were utilized including mass emails to African Americans employed at the university, letters to previous research participants, newspaper and radio interviews describing the study, and word-of-mouth from study participants. Recruitment occurred from October 2008 through April 2010. All participants completed an informed consent process approved by the UNC Charlotte Institutional Review Board. A total of 190 participants were recruited into the study (95 older parent-adult child pairs).

Study Inclusion and Exclusion Criteria

Eligible participants were African American, at least 21 years old, self-reported having been diagnosed with high blood pressure for at least 6 months, and were prescribed hypertensive medications. An individual was not enrolled until his or her partner, either parent or child who met the same eligibility criteria, was enrolled. During prescreening for enrollment, we confirmed participants' hypertension diagnosis by conducting a medication inventory and then verifying that they were prescribed one or more antihypertensive medications. For purposes of this analysis, individuals missing data on the variables of interest were excluded (n = 2); thus 188 individuals remained for analysis.

Measures

All data for this study were collected using an original survey. The six JNC7 prescribed hypertension self-care activities were assessed using the H-SCALE (Hypertension Self-Care Activity Level Effects), which was specifically designed for this purpose. The H-SCALE, its items and properties, have been previously described in detail [34]. Trained African

American research assistants (undergraduate students majoring in Public Health) conducted face-to-face interviews at the participant's preferred location (92% were in his or her home or the home of a relative also participating in the study). Interviews lasted an average of 58 min.

Exposure Variable

The exposure of self-efficacy to manage hypertension was derived from a five item scale (see Table 1). This scale was modified from an existing validated measure to assess self-efficacy to manage disease in general by substituting the words "high blood pressure" for "illness" [28]. Each item begins with the phrase "How confident are you that you can…?". Response options ranged from 1 (not confident at all) to 10 (totally confident). Internal consistency for the measure was good ($\alpha = .81$). A mean score was calculated and respondents who scored a 9 or above were classified as having good self-efficacy.

Outcome Variables

To assess medication adherence, three items related to the number of days in the past week that an individual (1) takes blood pressure medication, (2) takes it at the same time every day, and (3) takes the recommended dosage were used. Responses were summed and participants reporting that they followed these 3 recommendations on 7 out of 7 days were considered adherent. Internal consistency for this scale was good ($\alpha = .84$).

Twelve items assessed practices related to eating a low-salt diet, such as avoiding salt while cooking and eating, and avoiding foods high in salt content. Nine of the items were negatively phrased; these items were reverse coded. A mean score was calculated and participants who followed low-salt diet practices on 6 out of 7 days were considered adherent. Internal consistency for this scale was adequate ($\alpha = .74$).

Physical activity was assessed with two items. "How many of the past 7 days did you do at least 30 min 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. We established this criterion to ensure that participants had to engage in a combination of frequency and duration of activity and intensity of activity, in order to meet or exceed the minimum requirements of 150 min per week of moderate physical activity [36].

Smoking status was assessed with one item, "How many of the past 7 days did you smoke a cigarette or cigar, even just one puff?" Respondents who reported zero days were considered a nonsmoker.

Alcohol intake was assessed using an existing measure, the 3-item, National Institute on Alcohol Abuse and Alcoholism (NIAAA) Quantity and Frequency Questionnaire [37]. For these analyses, adherence 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 alcohol were considered abstainers. Internal consistency of the scale was good ($\alpha = .88$).

Adherence to weight management was assessed with ten items to determine dietary practices such as cutting portion size and making food substitutions as well as exercising to lose weight. Items were assessed based on recall of activities over the last 30 days. Using a 5-point Likert scale, participants who reported that they agreed or strongly agreed with all 10 items were considered adherent to weight management practices. Internal consistency of the scale was good ($\alpha = .87$).

Covariates

The study collected information on a number of potential confounders, including: age, gender, marital status, income and education, as well as health-related variables. Self-rating of health was assessed with responses ranging from excellent (5) to poor (1). Participants who reported good to excellent health were considered to have good self-rated health. Participants were asked if they had any additional chronic health problems from a prepared list of chronic conditions [38]. Participants reporting no additional chronic conditions in addition to hypertension were coded as “hypertension only”. Body mass index was calculated from self-reported weight in pounds and height in inches. Following conventional guidelines [39], BMI was categorized as normal weight (BMI ≥ 25.0), overweight (BMI > 25.0 and ≥30.0), obese (BMI > 30.0 and ≥40.0), and extremely obese (BMI > 40.0). We also assessed how many participants lacked health insurance.

Statistical Analyses

Frequencies and percentages were calculated for demographic and health characteristics as well as participants’ adherence to the self-care activities. Unadjusted odds ratios (ORs) and 95% confidence intervals (CIs) were obtained to examine the association between self-efficacy and hypertension self-care outcomes, and to identify other factors associated with the self-care outcomes. Since the data included parent–child dyads, a generalized estimating equations (GEE) approach was used to carry out logistic regression for correlated responses. Multivariate logistic regression for correlated responses was used to further explore the relationship between self-efficacy and hypertension self-care outcomes. A variable was considered to be a confounder of the association between good self-efficacy and a self-care outcome if it changed the OR by at least 10%. Ultimately, there were no confounders associated with good self-efficacy and the outcomes for low-salt diet adherence, physical activity, non-smoking, or weight management. For the good self-efficacy and medication adherence association, good self-rated health was identified as a confounder. For the self-efficacy and alcohol abstinence association, gender was confirmed as a confounder. Because the self-care outcomes were not rare occurrences, we used the odds ratio correction method proposed by Zhang and Yu [40] to provide a more reliable measure of the prevalence ratio for all unadjusted and adjusted associations. All analyses were conducted using SPSS v. 17 and statistical significance was set at $P \geq .05$.

Results

An overall statistical description of the sample (n = 188) by levels of self-efficacy is shown in Table 2. Participants ranged in age from 22 to 88 years, with a mean age of 53 years. Over half were age 50 or above and nearly 70% of the sample was female. Slightly more than a third of the sample was married. Over three-fourths rated their health as good to excellent. Eighty percent of the sample was overweight or obese based on body mass index. Approximately 11% of participants did not have health insurance. Adherence to hypertension self-care ranged from 22% for low-salt diet adherence to 75% for not smoking, with adherence to medication at 58%.

Bivariate and Multivariate Results

Demographic and Health Characteristics Associated with Hypertension Self-Care—In unadjusted analyses (see Table 3), participants aged 50 and older had increased prevalence of being adherent to medication (PR = 1.43, 95% CI: 1.13–1.69) as did women (PR = 1.51, 95% CI: 1.10–1.85), and these results were statistically significant. Overweight individuals had 39% lower prevalence for medication adherence (95% CI: 0.33–0.97). Being a woman was statistically significantly associated with higher prevalence of adherence to low salt diet techniques. For physical activity, being uninsured increased the prevalence of

adherence by 1.54 times (95% CI: 1.09–1.81). For adherence to smoking, women and those participants with a 4 year college or graduate degree had increased prevalence of not smoking (PR = Lacking health insurance reduced the prevalence of not smoking by 36% (95% CI: 0.36–0.92). Older age and gender were associated with increased prevalence of alcohol abstinence (PR = 1.53, 95% CI: 1.27–1.72; PR = 1.75, 95% CI: 1.43–1.99; respectively). Participants who had no other chronic conditions had reduced prevalence of being abstinent (PR = 0.79, 95% CI: 0.57–0.98), as did those who were uninsured (PR = 0.41, 95% CI: 0.18–0.74). Those who were extremely obese had 1.42 times the prevalence of being abstinent from alcohol (95% CI: 1.08–1.55). Having a 4 year college or graduate degree was associated with prevalence of weight management adherence in unadjusted analyses (PR = 1.71, 95% CI: 1.01–2.46.

Self-efficacy and Hypertension Self-Care—In models examining self-efficacy and hypertension self-care (see Table 4), good self-efficacy to manage hypertension was statistically significantly associated with a higher prevalence of adherence for five of the six JNC7 recommended self-care behaviors. In unadjusted results the prevalence of adherence with medication was 1.20 times higher among those with good self-efficacy as compared to those with poor self-efficacy. After adjusting for self-rated health, this prevalence was increased in magnitude and remained statistically significant (PR = 1.23, 95% CI: 1.08–1.32). In bivariate models, individuals with good self-efficacy had 64% higher prevalence of adhering to low salt diet strategies and 27% increased prevalence of engaging in physical activity (low salt diet: PR = 1.64, 95% CI: 1.07–2.20; physical activity: PR = 1.27, 95% CI: 1.08–1.39). Those with good self-efficacy had 10% higher prevalence of not smoking (PR = 1.10; 95% CI: 1.01–1.15). All of these associations were statistically significant. Participants with good self-efficacy had 63% higher prevalence of following good weight management strategies (PR = 1.63; 95% CI: 1.30–1.87). Self-efficacy was not statistically significantly associated with alcohol abstinence in unadjusted or adjusted models.

Discussion and Conclusion

Discussion

This study found that the majority of African American participants with hypertension had good self-efficacy to manage their chronic illness. Individuals with good self-efficacy had statistically significantly increased odds of being adherent to medication regimens, using low-salt diet techniques, engaging in physical activity, not smoking, and utilizing common weight management strategies. Consistent with other studies, self-efficacy is important to hypertension self-care [41] and is associated with weight management [33], and diet adherence [42]. Self-efficacy is also associated with antihypertensive medication adherence [4, 29, 30].

Better self-efficacy was not associated with abstaining from alcohol. It is possible that participants do not associate reducing alcohol consumption as a hypertension self-care behavior. This reasoning would suggest that health providers should intervene to increase awareness of alcohol consumption and its effects on hypertension management. Alternatively our measure of self-efficacy may not be specific enough to be associated with alcohol, perhaps because of its addictive quality [43, 44]. Alcohol intake has been associated with increased stress among African Americans, suggesting that it may be used as a form of stress coping [45].

In this sample of African Americans with hypertension, less than one-third of participants were practicing common strategies to maintain or lose weight even though most were clinically overweight or obese. African Americans may not realize how their weight status influences their blood pressure, and that losing or maintaining their weight as part of a

comprehensive chronic disease management strategy can have a positive effect on high blood pressure [46]. Findings from this study point to the need to develop and disseminate interventions which increase self-efficacy related to hypertension management and that include strategies for weight management or weight loss.

Importantly in this study we found that a disease-specific measure of self-efficacy was associated with multiple self-care behaviors. Typically self-efficacy is considered to be behavior-specific [25], as for example in the case of self-efficacy to take medication [29]. With this approach the investigator is required to measure participants' confidence level for each self-care activity and situation, potentially increasing participant burden. From a theoretical perspective, when assessing self-efficacy related to chronic illness self-management, our findings suggest that the disease context is important to measure; less emphasis may be placed on any one individual behavior. This finding suggests that encouraging patients to have more confidence in their ability to care for their high blood pressure may yield multiple benefits in terms of their self-care adherence. Importantly, self-efficacy is not a trait; it is a mutable characteristic and, therefore, amenable to intervention [25, 28].

Strengths and Limitations

The study findings should be interpreted with caution. Hypertension self-care activities were self-reported. Misclassification could have occurred if participants reported their behaviors incorrectly or inconsistently. It is also possible that there was recall bias, as participants were asked to report their adherence over either the past 7 day or 30 day (for weight management practices) time frame. Any misclassification would likely bias the results toward the null.

A second form of misclassification could have occurred because of the lack of established adherence criteria. Medication adherence has been measured with single items, multiple items, over varying time periods, and with different levels of adherence being deemed acceptable [47]. In this study we used a restrictive criterion and established medication adherence at 100%, which contributes to the strength of our findings. Minimum physical activity levels have been established for older adults (including those with chronic illness) at 150 min per week of moderate intensity [36]. We established our criteria for physical activity adherence to be higher than that because we also had younger participants in our study, and we wanted a measure that combined frequency and duration of activity with some assessment of intensity. Smoking is classified as an all or nothing activity, however, even with patients who do not smoke, it is important to assess how many live with smokers. Recent data suggest that non-smoking, African Americans continue to have passive smoking exposure; thus maintaining their disease risk [19]. While alcohol is firmly established as a risk factor for hypertension, recommended consumption levels remain contradictory given potential heart healthy benefits [48]. However, these benefits have not been established for African Americans [20]. The other two self-care activities measure practical techniques that people use to aid in eating a low-salt diet and/or losing or maintaining weight; thus no previous criteria for adherence have been determined.

Selection bias may have occurred. The African American adults who agreed to participate in this study could be different from those who did not participate. Notably this study recruited participants in parent–child pairs; adults with hypertension who did not have a parent with hypertension (or a living parent with hypertension) or an adult child diagnosed with hypertension may be different than those individuals enrolled in the study. If selection bias did occur, it could result in an over or underestimate of the true association.

We collected data on several potential confounders. One of these, years living with hypertension, could not be analyzed due to missing and inconsistent data. It is conceivable that increased years of living with hypertension could affect an individual's self-efficacy to manage the disease and/or a person's adherence to self-care. Inability to control for this variable could result in an over or underestimate of the true association.

This study used a cross-sectional design which precludes the ability to determine causality or direction. The study did not collect self-reported or actual measures of blood pressure; thus we cannot examine the association between self-efficacy and blood pressure control, or any of the self-care behaviors and blood pressure control.

Strengths of this study include the assessment of all six JNC7 recommended self-care behaviors using a validated measure specifically designed for this purpose. We also include the examination of a wide spectrum of demographic and health factors in relation to hypertension self-care activities among African Americans with hypertension. To limit potential biases, we used race congruent interviewers who conducted sessions in the participants' homes to reduce barriers to participation. Our sample included many younger adults with hypertension and the sample was middle class based on education and income. These two groups of African Americans are often missing from the hypertension research literature. Our measure of self-efficacy was short, valid and reliable and could easily be used in a primary care setting. The sample is diverse with respect to the demographic and health factors studied, although it should be noted that participants are from a Southern, urban area that may limit the generalizability of the results to all African Americans in the US. However, the results may be generalizable to other African Americans residing in cities in the Southeast US.

Conclusion

Self-efficacy to manage hypertension is associated with five of six JNC7 prescribed self-care activities for managing high blood pressure. Health care providers and public health practitioners should work within the context of hypertension self-care to increase patient knowledge and improve self-efficacy for hypertension management. African Americans may then have the prerequisite tools to more readily adopt and adhere to self-care behaviors with the potential to reduce significant health disparities. Future studies should be conducted to determine if a dose–response relationship exists at varying levels of adherence between these recommended self-care activities and blood pressure control.

Providers need to consider the role of self-care adherence among African Americans with uncontrolled hypertension. Assessment of individuals' self-care activities in addition to medication adherence is an important first step. Given the prevalence of hypertension within African American families and communities, and the poor health outcomes experienced by this segment of the population, African Americans may have low self-efficacy with respect to hypertension. They may require specific counseling and encouragement that hypertension is a manageable condition.

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Table 1

Self-efficacy to manage hypertension

1	Having *high blood pressure* often means doing different tasks and activities to manage your condition. How confident are you that you can do all the things necessary to manage your *high blood pressure* on a regular basis?
2	How confident are you that you can judge when changes in your *high blood pressure* mean you should visit a doctor?
3	How confident are you that you can do the different tasks and activities needed to manage your *high blood pressure* so as to reduce your need to see a doctor?
4	How confident are you that you can reduce the emotional distress caused by your *high blood pressure* so that it does not affect your everyday life?
5	How confident are you that you can do things other than just taking medication to reduce how much your *high blood pressure* affects your everyday life?

Table 2

Characteristics for African Americans by self-efficacy to manage hypertension

Characteristic	Good SE to manage HTN (n = 111)		Poor SE to manage HTN (n = 77)		Total (n = 188)	
	N	%	*N*	%	*N*	%
Age						
50 or older	65	58.6	45	58.4	110	58.5
Less than 50	46	41.4	32	41.6	78	41.5
Gender						
Female	75	67.6	59	76.6	134	71.3
Male	36	32.4	18	23.4	54	28.7
Marital status						
Married	38	34.2	29	37.7	67	35.6
Not currently married	73	65.8	48	62.3	121	64.4
Household income						
Over $50,000	33	29.7	31	40.3	64	34.0
$10,000–$50,000	56	50.5	33	42.9	89	47.3
0 to < $10,000	22	19.8	13	16.9	35	18.6
Education						
4 year college degree or better	23	20.7	25	32.5	48	25.5
Some college or 2 year degree	42	37.8	33	42.9	75	39.9
High school degree or less	46	41.4	19	24.7	65	34.6
Self-rated health						
Good to excellent	81	73.0	66	85.7	147	78.2
Fair or poor	30	27.0	11	14.3	41	21.8
Chronic conditions						
HTN only	19	17.1	18	23.4	37	19.7
Chronic condition + HTN	92	82.9	59	76.6	151	80.3
Body mass index						
Extremely obese (BMI ≥ 40.0)	13	11.7	10	13.0	23	12.2
Obese (BMI ≥ 30.0 but < 40.0)	38	34.2	29	37.7	67	35.6
Overweight (BMI ≥ 25.0 but < 30.0)	38	34.2	23	29.9	61	32.4
Normal weight (BMI < 25.0)	22	19.8	15	19.5	37	19.7

Characteristic	Good SE to manage HTN (n = 111)		Poor SE to manage HTN (n = 77)		Total (n = 188)	
	N	%	*N*	%	*N*	%
Uninsured						
Yes	14	12.6	7	9.1	21	11.2
No	97	87.4	70	90.9	167	88.8
Medication adherence						
Yes	56	50.5	53	68.8	109	58.0
No	55	49.5	24	31.2	79	42.0
Low-salt diet adherence						
Yes	18	16.2	24	31.2	42	22.3
No	93	83.8	53	68.8	146	77.7
Physical activity adherence						
Yes	48	43.2	50	64.9	98	52.1
No	63	56.8	27	35.1	90	47.9
Non-smoking adherence						
Yes	77	69.4	64	83.1	141	75.0
No	34	30.6	13	16.9	47	25.0
Alcohol abstinence						
Yes	70	63.1	53	68.8	123	65.4
No	41	36.9	24	31.2	65	34.6
Weight management adherence						
Yes	22	19.8	35	45.5	57	30.3
No	89	80.2	42	54.5	131	69.7

Table 3

Corrected unadjusted associations between demographic and health characteristics and hypertension self-care activities

	Medication adherence PR (95% CI)	Low-salt diet adherence PR (95% CI)	Physical activity adherence PR (95% CI)	Nonsmoking PR (95% CI)	Alcohol abstinence PR (95% CI)	Weight management adherence PR (95% CI)
Age						
50 or older	1.43 (1.13–1.69)	1.02 (0.62–1.57)	0.84 (0.59–1.11)	1.10 (0.94–1.23)	1.53 (1.27–1.72)	1.18 (0.74–1.71)
Less than 50	Referent	Referent	Referent	Referent	Referent	Referent
Gender						
Female	1.51 (1.10–1.85)	2.04 (1.01–3.58)	1.08 (0.78–1.37)	1.23 (1.04–1.36)	1.75 (1.43–1.99)	1.15 (0.68–1.76)
Male	Referent	Referent	Referent	Referent	Referent	Referent
Marital status						
Married	1.05 (0.78–1.30)	0.75 (0.40–1.30)	0.95 (0.67–1.20)	1.05 (0.86–1.18)	1.08 (0.83–1.27)	1.13 (0.69–1.68)
Not currently married	Referent	Referent	Referent	Referent	Referent	Referent
Household income						
$50,000 or more	1.07 (0.69–1.40)	0.90 (0.36–1.88)	0.97 (0.59–1.33)	1.10 (0.90–1.23)	0.74 (0.43–1.07)	1.68 (0.93–2.47)
$10,000–$49,999	0.98 (0.66–1.27)	0.79 (0.34–1.58)	1.19 (0.79–1.57)	1.11 (0.93–1.23)	0.76 (0.47–1.05)	1.43 (0.80–2.13)
Less than $10,000	Referent	Referent	Referent	Referent	Referent	Referent
Education						
4 year college degree or better	1.15 (0.80–1.44)	1.32 (0.64–2.35)	1.08 (0.68–1.43)	1.25 (1.06–1.35)	0.81 (0.53–1.08)	1.71 (1.01–2.46)
Some college or 2 year degree	0.89 (0.63–1.13)	0.80 (0.39–1.46)	1.06 (0.72–1.37)	1.06 (0.90–1.17)	0.84 (0.58–1.09)	1.14 (0.69–1.68)
High school degree or less	Referent	Referent	Referent	Referent	Referent	Referent
Self-rated health						
Good to excellent	0.81 (0.55–1.05)	1.35 (0.64–2.46)	1.23 (0.82–1.62)	1.20 (0.98–1.34)	0.86 (0.59–1.08)	1.37 (0.82–2.06)
Fair or poor	Referent	Referent	Referent	Referent	Referent	Referent
Chronic conditions						
Hypertension only	0.84 (0.57–1.08)	1.11 (0.59–1.82)	1.78 (0.91–1.54)	0.93 (0.72–1.08)	0.79 (0.57–0.98)	1.30 (0.75–2.07)
Additional chronic conditions	Referent	Referent	Referent	Referent	Referent	Referent
Body mass index						
Extremely obese	0.69 (0.30–1.16)	0.73 (0.21–1.95)	0.91 (0.45–1.38)	1.13 (0.80–1.28)	1.42 (1.08–1.55)	0.46 (0.15–1.20)
Obese	0.70 (0.38–1.06)	0.99 (0.45–1.89)	1.23 (0.78–1.63)	1.07 (0.81–1.23)	1.11 (0.82–1.32)	0.90 (0.47–1.53)
Overweight	0.61 (0.33–0.97)	1.06 (0.47–2.04)	0.93 (0.53–1.32)	0.99 (0.73–1.15)	0.99 (0.72–1.20)	0.83 (0.42–1.45)

	Medication adherence PR (95% CI)	Low-salt diet adherence PR (95% CI)	Physical activity adherence PR (95% CI)	Nonsmoking PR (95% CI)	Alcohol abstinence PR (95% CI)	Weight management adherence PR (95% CI)
Normal weight	Referent	Referent	Referent	Referent	Referent	Referent
Uninsured						
Yes	0.55 (0.28–0.91)	0.39 (0.09–1.43)	1.54 (1.09–1.81)	0.64 (0.36–0.92)	0.41 (0.18–0.74)	0.62 (0.22–1.39)
No	Referent	Referent	Referent	Referent	Referent	Referent

Table 4

Corrected unadjusted and corrected adjusted prevalence ratios and 95% confidence intervals for the associations between self-efficacy and adherence to recommended hypertension self-care behaviors (n = 188)

	Good SE to manage HTN	Poor SE to manage HTN
Medication adherence		
Unadjusted PR (95% CI)	1.20 (1.05–1.31)	1.00 (Referent)
Adjusted PR (95% CI)[a]	1.23 (1.08–1.32)	1.00 (Referent)
Low-salt diet adherence		
Unadjusted PR (95% CI)	1.64 (1.07–2.20)	1.00 (Referent)
Adjusted PR (95% CI)	N/A	N/A
Physical activity adherence		
Unadjusted PR (95% CI)	1.27 (1.08–1.39)	1.00 (Referent)
Adjusted PR (95% CI)	N/A	N/A
Non-smoking		
Unadjusted PR (95% CI)	1.10 (1.01–1.15)	1.00 (Referent)
Adjusted PR (95% CI)	N/A	1.00 (Referent)
Alcohol abstinence		
Unadjusted PR (95% CI)	1.08 (0.87–1.23)	1.00 (Referent)
Adjusted PR (95% CI)[b]	1.05 (0.81–1.21)	1.00 (Referent)
Weight management adherence		
Unadjusted PR (95% CI)	1.63 (1.30–1.87)	1.00 (Referent)
Adjusted PR (95% CI)	N/A	N/A

[a] Adjusted for good self-rated health

[b] Adjusted for gender