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Original article

Factors associated with physical activity in African Americans with hypertension☆

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ABSTRACT

Background: Pharmacological management only controls 58% of those with hypertension. Combining pharmacological therapy with physical activity is important in controlling hypertension.
Aim: To examine factors associated with physical activity (PA) adherence in African Americans (AAs) with hypertension and antihypertensive medication adherence.
Methods: A cross-sectional descriptive correlational design was used to examine if systolic BP, co-morbidities, serum creatinine and potassium, education, depression, locus of control, and social support explained PA adherence in a convenience sample of AAs ($N = 77$) aged 55 to 84. All completed: demographic data, PA visual analog scale (VAS-PA); Multidimensional Health Locus of Control Scale; Patient Health Question-9 Depression Instrument. Physiological data and co-morbidities were also collected.
Results: A third ($n = 26$) had systolic BP over 140 mm/Hg. The model explained 26% variance in adherence to PA ($F = 3.378$ [8, 68]; $p = .003$) with creatinine ($p < .05$), depression ($p < .01$), and social support ($p < .05$) as significant. Differences in VAS-PA scores between levels of depression were significant ($F = 4.707$ [269], $p = .012$; $Eta^2 = 0.12$). Those with no depression had significantly higher PA adherence ($M = 88.26$, $SD = 18.97$) compared to mildly depressed ($M = 70.24$, SD 27.71) and moderately depressed ($M = 66.83$, $SD = 23.31$).
Conclusions: Clinicians should promote PA as an adjunct to medications for effective control of hypertension in AAs. Screening and intervening for depression are important when examining adherence to PA in AAs with hypertension.

1. Introduction

Hypertension (HTN) is a worldwide epidemic, affecting one third of adults or one billion people. (Benjamin et al., 2017; Yoon, Fryar, & Carroll, 2015). Although much progress has been made in the treatment of cardiovascular disease (CVD), HTN continues to be a major public health challenge. Untreated HTN can lead to heart disease and stroke, two of the leading causes of death in the United States (U. S.) (Benjamin et al., 2017; CDC, 2013). Furthermore, HTN disproportionately affects African Americans (AA) more than all other races (41.2% vs 28%, respectively) (Nwankwo, Yoon, Burt, & Gu, 2013; Yoon et al., 2015). Despite the majority of the AA population receiving HTN pharmacological management services, only 58% have blood pressure (BP) control at their target levels compared to 65% of Caucasians (Benjamin et al., 2017; Ostchega, Yoon, Hughes, & Louis, 2008). Additionally, the effects of HTN in AAs may be more severe, as AAs suffer more co-morbidities and renal complications related to HTN than other races, and often HTN manifests in AAs during young adulthood between the ages 18 and 39 (Aronow et al., 2011; CDC, 2013; Ferdinand, 2010; Mozaffarian et al., 2016). A number of physiological traits, environmental characteristics, and behavioral factors contribute to this disparity, all of which contribute to outcomes of early morbidity and mortality in the AA population (Benjamin et al., 2017; Center for Disease Control and Prevention, 2013). Thus, to improve health

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outcomes in AAs with HTN, a comprehensive approach, including pharmacological therapy and lifestyle management is vital, along with understanding the potential influence of other factors affecting lifestyle management such as co-morbidities, creatinine and potassium serum levels, education, depression, locus of control (LOC), and social support.

Evidence supports pharmacological therapy in achieving the goal of lowering BP to improve overall health outcomes, yet lifestyle modifications are less studied. The recent 2017 HTN guidelines denote the importance of individualized tailored approach including lifestyle changes which addresses all CV risk factors (Greenland & Peterson, 2017). In the AA population, less is known about lifestyle behaviors and the effect on HTN. Participation in PA decreases BP (Whelton, Chin, Xin, & He, 2002). Unfortunately, the American College of Cardiology and the AHA guidelines on lifestyle reported that most studies examining the effects of lifestyle changes, physical activity (PA) and diet, have not included those with HTN (Eckel et al., 2014).

The management of HTN requires self-regulation (Chen, Tsai, & Lee, 2009). Multiple factors associated with PA participation, especially in AAs, is essential to affect health outcomes. Factors supporting participation in PA include social support (Anderson, Wojcik, Winett, & Williams, 2006; Gothe & Kendall, 2016; Thompson et al., 2003) and education (Alkerwi et al., 2015; Dinwiddie, Zambrana, Doamekpor, & Lopez, 2015). Depression also influences participation in PA and is clearly linked to CVD (Almas et al., 2014; Rogerson, Murphy, Bird, & Morris, 2012). While it is known that depression affects medication adherence (Grenard et al., 2011; Schoenthaler et al., 2015) in those with HTN, little is known about how depression affects lifestyle behavior of PA in HTN patients with high medication adherence.

Motivation, control or the ability to regulate behavior is also a factor influencing participation and maintenance of PA (Peters & Templin, 2008; Ryan & Deci, 2007; Teixeira, Carraça, Markland, Silva, & Ryan, 2012). The extent to which people believe they can regulate or have control over their own behavior, referred to as LOC, can reside either “internal” or “external” to the individual (Wallston & Wallston, 1981). Internal LOC constitutes the belief that health is the result of one's own action; whereas external LOC is the premise that individual health outcomes are controlled by others, fate, or chance. Health LOC has been identified as a predictor of self-care adherence in individuals with known chronic diseases such as asthma and heart failure (Ahmedani, Peterson, Wells, Rand, & Williams, 2013; Rydlewska et al., 2013). Therefore, determining if health LOC influences PA participation, an essential self-care management behavior for HTN, is important in promoting lifestyles interventions to control HTN. The purpose of this study was to examine factors associated with PA participation in AAs with HTN who have high pharmacological optimization.

2. Methods

We used a cross-sectional descriptive correlational design for the following research questions: (a) What proportion of AAs with HTN demonstrate lower versus higher PA?, and (b) Do systolic BP, co-morbidities, serum levels of creatinine and potassium, education, depression, LOC, and social support explain PA participation in AAs with HTN?

2.1. Design/sample

After approval from the institutional review board, we recruited AAs from a clinic in the rural southeastern region of the U. S. who recently completed the Systolic Blood Pressure Intervention Trial (SPRINT) (The SPRINT Research Group, 2015). The SPRINT study was a multi-center randomized clinical trial comparing the safety and efficacy of intensive BP management to standard management. The purpose of the study was to compare outcomes of a targeted systolic BP of < 120 mmHg to 140 mmHg (The SPRINT Research Group, 2015). Over 9000 participants were enrolled meeting the inclusion criteria of: (a) age ≥ 50 years, (b) HTN with systolic blood pressure > 130 mmHg, and (c) one risk factor of heart disease. Exclusion criteria for SPRINT included a diagnosis of cancer, stroke or any known terminal illnesses. Those enrolled in SPRINT received medication at no cost and were closely monitored by health care providers. The trail ended early due to lower rates of CV deaths, MI, stroke, heart failure, and acute coronary syndrome (Berlowitz et al., 2017).

The sample of this study consisted of AAs with a diagnosis of HTN who completed the SPRINT study. They were English speaking, and were cognitively intact as noted on their medical record. Because this study only enrolled AA participants who completed SPRINT in the past the 6 to 12 month period, medication adherence was re-examined. All eligible participants reported high adherence to their medications with a mean of 99% in this study. This was not a surprise finding, as the larger clinical study provided all medications and a comprehensive team management approach. Participants meeting eligibility requirements scheduled an appointment to review the study, provide informed consent, and complete the questionnaires. Appointments were held in an outpatient clinic and lasted approximately 1 h.

2.2. Measures

Participants completed an investigator developed demographic health assessment tool. Identification of who provides the most social support was self-reported as an open-ended question. The degree of perceived social support received was self-reported on a Likert scale and measured as: none of the time, a little of the time, some of the time, a good bit of the time, most of the time, and all of the time. A separate visual analog (VAS) scale using a 0–100 mm with anchors on each end ranging from 0 (no support) and 100 mm (support all the time) was used to denote specific social support for PA participation. Physical activity participation, defined as any activity that requires energy expenditure for a minimum of 30 min at least 4 times a week (Ghadieh & Saab, 2015), was measured using a self-reported 0–100 mm visual analog scale (VAS-PA) with anchors on each end ranging from 0 (none of the time) to 100 mm (all of the time). The distribution of scores was divided into quartiles to achieve the best measure of central tendency, using the 50th percentile to designate those with high and low PA participation. The background physiological data were retrieved and included the current systolic BP, body mass index, and potassium and creatinine serum levels. Co-morbidities were also retrieved, which included categories of CVD other than stroke, chronic respiratory diseases, chronic kidney disease, diabetes, and arthritis. Participants also completed standardized instruments.

2.3. Instruments

Standardized instruments included: (a) Multidimensional Health LOC (MHLC) Scale, and (b) Patient Health Question-9 Depression (PHQ-9) Instrument.

The MHLC is an 18 item, self-reported scale with response choices on a 6-point Likert scale:

(1) = strongly disagree, (2) = moderately disagree, (3) = slightly disagree,

(4) = slightly agree, (5) = moderately agree, and (6) = strongly agree. It has two 6-item subscales for a person's beliefs regarding where control over their health lies, whether internal or external. Each participant had an internal and external LOC score. The Cronbach alpha for this study was 0.78, and is comparable to Wallston's normative data with a reported Cronbach alpha coefficient as 0.67 to 0.77 (Kuwahara et al., 2004; Wallston, 2007).

The PHQ-9 is a self-reported measure of depression recommended by the AHA Panel on Depression and Coronary Heart disease (Lichtman et al., 2008). Response choices are on a 4-point Likert scale of 0–3 representing not at all, several days, more than half the days, and nearly