

A Proposed New Model of Hypertensive Treatment Behavior in African Americans

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African Americans have poorer levels of hypertensive control than their white counterparts in the US population. Multiple studies have examined the factors that contribute to this discrepancy, but no literature review has yet attempted to place these findings within the framework of health behavior theory. The Health Belief Model (HBM) and social cognitive theory (SCT) are 2 complementary models of health behavior theory that provide a unifying structure to interpret this broad body of literature. Inaccurate lay public understanding of hypertensive illness and its consequences contributes to decreased perceived severity and susceptibility to hypertension; lower rates of compliance with lifestyle recommendations reflect several common perceived barriers along with low self-efficacy and outcome efficacy regarding hypertensive treatments. Public health workers and health care providers must understand these factors within a socioecological perspective if they are to design effective interventions to assist African Americans in meeting antihypertensive treatment goals.

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INTRODUCTION

African Americans have higher rates of hypertension than whites, and African Americans with hypertension have poorer rates of hypertension control.¹⁻⁷ These 2 factors contribute to a much higher rate of hypertensive complications, including heart disease and stroke, in African Americans compared to whites.¹⁻⁷

Neither level of education nor general knowledge of hypertension correlate with African Americans' blood pressure control.¹ African Americans test as well as whites on hypertension knowledge assays,⁴ and their access to health care providers does not correlate with blood pressure control.⁸ Factors beyond general hypertension knowledge and access to care, then, must be responsible for inadequate hypertensive control in this population.^{1,8}

Insufficient adoption of hypertension treatment recommendations is a more likely cause.⁹ Comprehensive treatment for hypertension involves dietary change, exercise, and medication (Table 1), and health care providers have a wide array of tools, from several different types of antihypertensive medications to extensive knowledge about lifestyle behaviors, to care for their patients with hypertension.¹⁰ African Americans, in general, are less physically active,^{11,12} eat fewer fruits and vegetables,^{11,13} and have higher body mass index (BMI) than whites.¹³ African Americans also have lower rates than white patients of compliance with their antihypertensive medications.^{2,14,15}

African Americans' lower rates of adherence to these recommendations may be the result of lay beliefs that are inconsistent with the biomedical disease model of hypertension. For example, African Americans tend to think of high blood pressure not as a chronically progressive and silent condition but instead as an episodic^{3,6} and symptomatic^{3,6,16} disease. Additionally, most African Americans believe that the main cause of hypertension is stress,^{3,17-19} resulting from "being black,"^{216,17} experiencing racism,¹⁸ coping with multigenerational family responsibilities,¹⁷ and feeling a need to overachieve in all environments to compensate for society's racial pressures.¹⁷ Identifying specific, relevant health beliefs such as these and placing them into a rigorous theoretical framework can aid public health workers and health care providers in designing effective hypertensive control interventions for African Americans.

THE HEALTH BELIEF MODEL AND SOCIAL COGNITIVE THEORY: TWO COMPLIMENTARY THEORIES

The Health Belief Model (HBM) states that people will actively prevent, screen for, or control disease conditions if they consider themselves susceptible to the condition, if they believe it could have potentially serious consequences, and if they believe that the benefits of taking action outweigh their imagined barriers to taking that action.²⁰

Social cognitive theory (SCT) explains human behavior in terms of a triadic model in which behavior, personal thoughts and beliefs, and the environ-

ment interact.²¹ Unlike the HBM, which only considers the individual's role in health beliefs and behaviors, SCT considers the individual in the context of his or her environment.²²

Several constructs of HBM are useful for understanding African Americans' behaviors regarding the recommended lifestyle changes for hypertension, including perceived susceptibility (how likely an individual thinks it is that she or he may get the condition²⁰), perceived severity (how serious a condition and its consequences are²⁰), perceived barriers (financial and emotional costs²⁰), and self-efficacy (confidence in one's ability to act or change²⁰). Researchers have applied constructs of HBM to understanding African American perceptions about many other health conditions, including influenza,²³ breast cancer,^{24,25} osteoporosis,²⁶ diabetes,^{27,28} colon cancer,²⁹⁻³¹ prostate cancer,^{32,33} HIV/AIDS,^{34,35} and asthma.³⁶

SCT's constructs resemble some of HBM's constructs. SCT has a self-efficacy construct that resembles HBM's self-efficacy construct but adds confidence in the ability to overcome impediments;²² SCT's self-efficacy is confidence in performing a behavior and also overcoming barriers to the performance of that behavior.²¹ SCT's expanded self-efficacy concept makes it more appropriate to use for a model involving treatment behaviors, and so it is SCT's self-efficacy, and not HBM's, that this proposed new model incorporates. To this self-efficacy construct SCT adds an outcome efficacy construct, a behavior's anticipatory outcomes.²¹ Persons with a low expectation that a given behavior will produce the desired result are less likely to engage in the behavior than those who believe the converse.²² Researchers have applied constructs of SCT to understanding African American perceptions about nutrition,^{37,38} physical activity,³⁷ condom use,^{39,40} adolescent pregnancy,⁴¹ sexually transmitted diseases,⁴² and organ donation.⁴³

Health Belief Model: Perceived Seriousness and Perceived Susceptibility

Instead of taking medications daily as prescribed, many African Americans (and, indeed, others in the United States and around the world⁴⁴) adjust their medication dosing based on the subjective experience of symptoms that they attribute to high blood pressure such as headaches,^{16,18} lightheadedness,¹⁸ fatigue,¹⁶ or heart palpitations.¹⁶ During times with no symptoms, perceived seriousness of hypertension is low and may result in nonadherence to treatment. Additionally, Lukoschek's

study of African American focus groups found that several of the nonadherent group members did not have any symptoms at the time of their diagnosis with high blood pressure, thereby leading them to doubt the validity of the diagnosis.¹⁸

African Americans do know that high blood pressure can contribute to heart disease and stroke,^{4,18} but some may be underestimating their susceptibility to both hypertension and its complications by relying on subjective symptoms to confirm their diagnosis.

Health Belief Model: Perceived Barriers

Overriding perceived barriers for all lifestyle interventions, be they diet-, exercise-, or medication related, were financial cost^{1,6,13,16,17,45} and time.^{17,46,47} Additional perceived barriers to dietary change included lack of locally convenient places to buy healthy food⁴⁵ and the social isolation of eating foods that differ from what family and friends are eating.^{13,46} Additional perceived barriers to exercise included inadequate public facilities for exercise^{46,47} and living in unsafe neighborhoods to walk or jog in.^{46,47} An additional perceived barrier to medication adherence was concern about side effects,^{3,6} especially male impotence.^{6,17}

Social Cognitive Theory: Self-Efficacy

Bopp et al found that high physical activity self-efficacy correlates with physical activity behaviors in both men and women,¹² but a significant proportion of those surveyed actually had low self-efficacy regarding exercise.¹² Some members of Horowitz et al's focus groups of African Americans described treating their disease by avoiding certain foods and eating fewer calories, but these same members also described how difficult these behaviors are to do consistently.¹³ Other members of these groups, along with the majority of Rose et al's focus groups of African American men, felt these changes were too difficult for them to implement.^{13,16} Self-efficacy beliefs about diet changes and exercise regimens seem, though not entirely, to be low among African Americans.

Social Cognitive Theory: Outcome Efficacy

Patients' outcome efficacy beliefs regarding elements of their treatment regimen (eg, diet, exercise, medication) are an important determinant in their decision to adhere to those recommendations. Patients with low outcome efficacy beliefs regarding diet and exercise, for

Table 1. Treatment Recommendations for Hypertension

Lifestyle	<ul style="list-style-type: none"> • Eat a low salt diet.¹⁶ • Eat to obtain or maintain a healthy weight.¹⁶ • Get regular cardiovascular exercise.¹⁷
Medication	<ul style="list-style-type: none"> • Take daily medications exactly as prescribed.¹²

example, are less likely to make these lifestyle modifications, and patients with low outcome efficacy beliefs regarding their medications are less likely to take them daily as recommended. Indeed, a sizable proportion of African Americans believe that lifestyle changes will not improve their blood pressure.^{4,13,47}

Different researchers have reached different conclusions about African Americans' outcome efficacy beliefs regarding medications. African Americans are twice as likely as whites to state that medication is the only effective way to treat high blood pressure,⁴ but many studies have found that African Americans often rely upon a large number of nonpharmacologic remedies such as garlic,^{3,13,18,19} herbs,^{3,13} lemon juice,^{18,19} and vinegar^{13,18,19} in lieu of taking their prescribed medications. These apparently conflicting findings, though, are actually all consistent with the lay African American conceptualization of hypertension.

Since many African American patients believe that hypertension is an episodic, symptomatic illness,^{3,6,16} they may have low outcome efficacy regarding their treatment when they are not experiencing symptoms, which, in turn, may lead to nonadherence to treatment. Taking medications episodically guarantees inadequate blood pressure control and an increased risk of cardiovascular complications. Reinforcement of this outcome expectancy may occur when patients experience these complications, or see them in others, after following what they consider to be an adequate treatment regimen,¹⁹ be it medication or a nonpharmacologic remedy. Conversely, patients who do not experience such complications may maintain high belief in the outcome efficacy of whatever treatment they are using.

Implications for Interventions

The gap in hypertensive control between whites and African Americans is widening,⁵ and studies examining hypertensive control in predominantly minority populations find that nonadherence to treatment regimens, and not a failure to diagnose or initiate treatment, is the primary cause for inadequate blood pressure control in African American patients.^{6,14,15,18}

Once patients have the appropriate knowledge (per-

ceived severity and susceptibility) about their hypertension, interventions can help them change their behavior by combining their self-efficacy belief with the outcome expectation that successful treatment benefits will outweigh disadvantages of the lifestyle changes.²² These HBM and SCT constructs—perceived severity and susceptibility, perceived barriers, self-efficacy, and outcome efficacy—provide multiple prospective targets for public health interventions (Table 2). The proposed new model (Figure 1) also includes SCT's environment construct, the external factors that affect the beliefs associated with health behavior.²¹ This proposed new model incorporates a thorough literature review of African American hypertension treatment beliefs with these well-established constructs of health behavior theory to provide a potential platform for designing efficacious public health interventions.

This proposed new model fits well within the broadly accepted general model of the determinants of behavioral change (Figure 2). The general model of the determinants of behavioral change provides a unifying base to connect the often overlapping constructs of the prominent health behavior theories in current use.⁴⁸ The proposed new model of hypertensive treatment behavior maps well over this framework, further reinforcing its theory-based origins and presumed utility in designing public health interventions.

Two interesting factors emerged from the literature regarding hypertension regimen adherence interventions. First, interventions that simultaneously address multiple constructs may be more effective than interventions that focus on only 1 construct. Roumie et al found that a combination of physician education (environment), patient education (constructs), and pharmacy-physician communications (environment) better increased patients' blood pressure control than patient education alone.⁴⁹ A review of hypertension goal attainment in patients with diabetes found that interventions with the largest positive change were multifactorial.^{49,50}

Second, popular media, and specifically television, may offer a possible vehicle for effecting change in health beliefs. Okonofua et al found in their national survey of more than 1000 Americans that Americans of

Table 2. Health Belief Model (HBM) & Social Cognitive Theory (SCT) Constructs and Relevant Lay Health Beliefs

	Construct	Relevant Lay Health Beliefs
HBM	Perceived severity & perceived susceptibility	<ul style="list-style-type: none"> • Hypertension is episodic and symptomatic. • Stress causes hypertension. • Financial cost • Insufficient time • Undesirable medication side effects • Doubt ability to make diet changes • Doubt ability to exercise regularly • Diet changes may not lower blood pressure • Exercise may not lower blood pressure. • Medications may not lower blood pressure.
	Perceived barriers	
SCT	Self-efficacy	
	Outcome efficacy	

Figure 1. A Proposed New Model of Hypertensive Treatment Behavior in African Americans

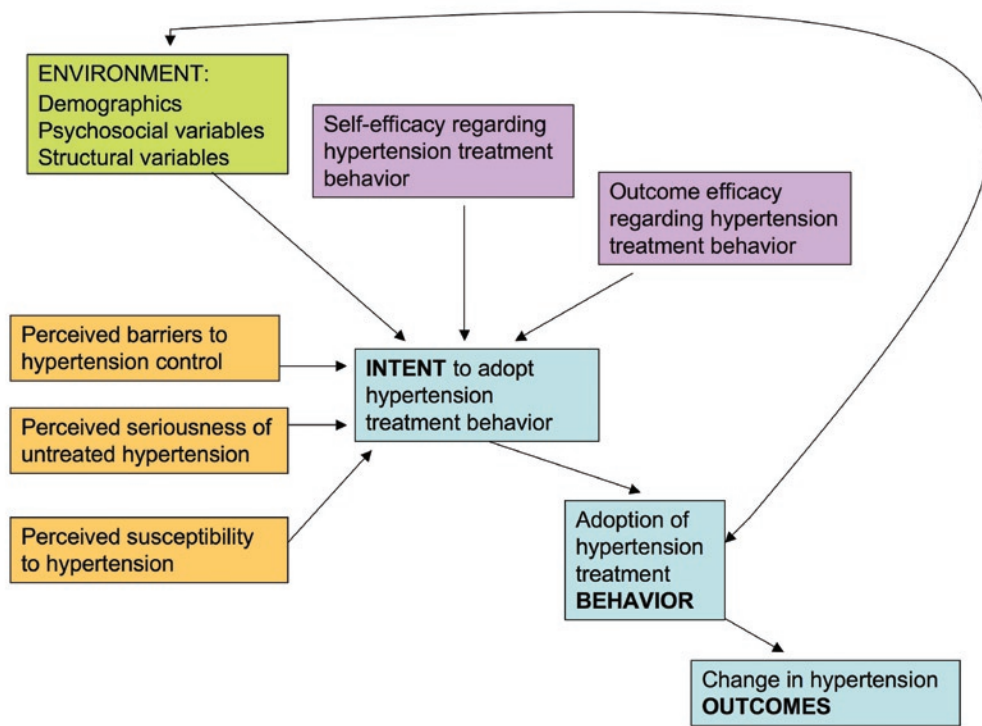
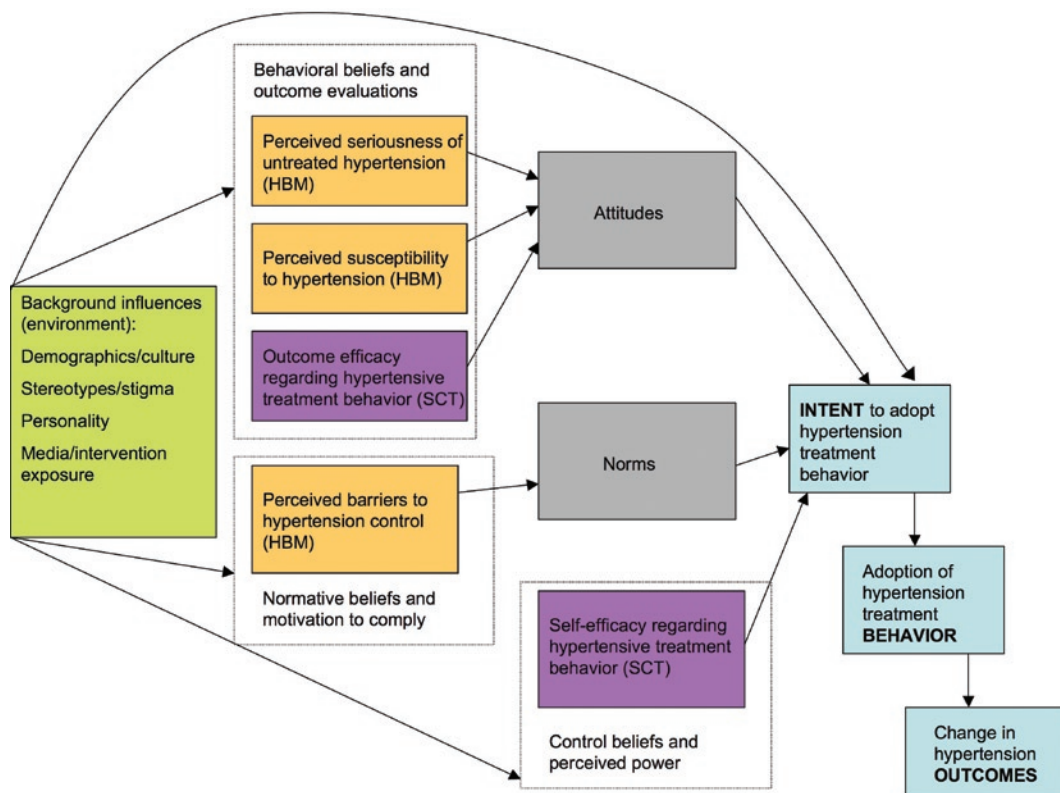


Figure 2. Mapping of the Proposed New Model Onto the General Model of the Determinants of Behavior Change



all ethnic groups obtain information more often from television than any other source.⁴ Television offers an opportunity to change lay perceptions and offer suggestions about how to overcome commonly identified barriers.²² Television also allows depictions of vicarious experiences and social persuasion; vicarious experiences and social persuasion are 2 possible ways to increase self-efficacy.^{22,47} Webb and Gonzalez's focus groups of African American women stated though that the media targets the health issues of white Americans and not issues of particular significance for African Americans.¹⁷ They recommended tailoring messages specifically for African Americans;¹⁷ television may be 1 potential medium to provide this culturally sensitive health programming.

CONCLUSION

African Americans are not sufficiently adhering to hypertension treatment recommendations regarding diet, exercise, and medications. Factors involving constructs from both the HBM and SCT contribute to this failure: the African American lay understanding of hypertension diverges from medical understanding, leading to low perceived seriousness and susceptibility; many common perceived barriers prevent African Americans from making recommended lifestyle changes; and, African Americans doubt lifestyle changes' achievability and efficacy, contributing to low self-efficacy and outcome efficacy beliefs. This proposed new model combines these complementary constructs of HBM and SCT to offer a novel approach to hypertensive treatment behavior interventions. Its constructs provide many potential targets for intervening to improve treatment adherence, although the best interventions will likely be those that work on several of those targets simultaneously. Furthermore, television and video media may be an intervention tool worth exploring.

This new model's utility in behavioral intervention design is, however, unproven. Future research should focus on the design and evaluation of hypertension treatment interventions using the constructs of this model.

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