

CHARACTERISTICS OF INSUFFICIENTLY ACTIVE HYPERTENSIVE BLACK WOMEN WHO VOLUNTEER TO BE IN A PHYSICAL ACTIVITY PROMOTION INTERVENTION: AN APPLICATION OF SOCIAL COGNITIVE THEORY AND THE TRANSTHEORETICAL MODEL

Background: Hypertension is a significant public health problem for Black American women. Increasing physical activity is an effective way to manage hypertension. However, Black women are among the least physically active racial/ethnic/gender group. In this paper we identify the positive resources and areas of need among insufficiently active Black hypertensive women who presented to a study to increase their level of physical activity.

Methods: Women completed questionnaires to assess self-efficacy to overcome barriers to physical activity, confidence to use self-motivation to engage in behaviors supportive of a physically active lifestyle, friend and family social support for physical activity, and behavioral and cognitive strategies associated with physical activity.

Results: Sixty-one insufficiently active Black hypertensive women participated in the study. The mean age of the sample was 50.48 ± 4.2 years. The mean body mass index was 35.97 ± 6.88 kg/m². Resting blood pressure was $133.28/78.21 \pm 16.41/8.96$ mm Hg. According to the Transtheoretical Model stages of change, 88.52% of the sample was in contemplation. Women reported a moderate level of confidence to overcome barriers, a moderate level of confidence to use self-motivation, and reported that barriers rarely interfered with their ability to be physically active. However, women had little friend or family support for physical activity and only rarely used behavioral strategies to encourage their activity.

Conclusion: To further support this population, physical activity interventions should focus on developing social support networks and teaching a variety of behavioral strategies important to the adoption of an active lifestyle. (*Ethn Dis.* 2007;17:604–610)

Key Words: Physical Activity, Hypertensive Black Women

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INTRODUCTION

A physically active lifestyle plays an important role in the management of hypertension. Regular activity can prevent or delay its development, improve the efficacy of antihypertensive drugs, and reduce blood pressure.¹ Increasing the proportion of physically active hypertensive adults is a national health objective and a leading indicator of progress toward a healthier America.²

This goal is especially salient for American Black women. Compared to women of other racial/ethnic groups, both the prevalence of high blood pressure and the risk for hypertension-related morbidity and mortality are greater among Black women.³ Moreover, Black women are not sufficiently active to gain health benefits associated with an active lifestyle^{4–7} and are among the least active racial/ethnic/gender group.^{6–9}

For Black women who are successful at engaging in regular physical activity, maintaining this level of activity is difficult. In one study, only 18% of Black women maintained their active lifestyle for more than six months.¹⁰ Although engaging Black women in a physically active lifestyle is a public health priority, few theoretically based physical activity interventions have been

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tailored to hypertensive Black women. Developing effective interventions requires a population-specific understanding of the constructs important for physical activity. Social cognitive theory (SCT), a theory that posits that behavior is the result of the interaction among personal, behavioral, and environmental factors,¹¹ and the Transtheoretical Model (TTM), a model that suggests that individuals are at different motivational stages of readiness to change behavior,^{12,13} provide direction for intervention development. Individually adapted health behavior change interventions based on these theories and tailored to reflect the participant's stage of motivational readiness, preferences, and interests are strongly recommended to promote physical activity.¹⁴

The present study had one specific goal: to identify the positive resources and areas of need among insufficiently active Black hypertensive women who volunteered to participate in a randomized trial designed to increase physical activity. Using the framework of SCT and TTM, we describe the psychosocial and behavioral baseline characteristics of

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this population before study randomization.

METHODS

Eligible participants were hypertensive Black women aged 40–65 years. Women were recruited through two methods: advertisement in the university's newspaper and invitations mailed to Black, female university employees within the target age range. Mailing lists were obtained from the human resources department. All advertisements specifically targeted women with hypertension. During a telephone screening we administered the Physical Activity Stages of Change Questionnaire¹⁵ to assess stage of readiness to be physically active. The questionnaire assessed a woman's level of moderate-intensity physical activity. Women were included if they were not regularly physically active (ie, did not have a total of at least 30 minutes of physical activity at least five days per week).¹⁶

Before study enrollment, women obtained medical clearance from their personal physicians. For safety reasons, women with preexisting medical concerns (eg, systolic blood pressure ≥ 180 mm Hg; history of myocardial infarction, angina, or other evidence of ischemic heart disease; history of ischemic changes during exercise test; arrhythmias not controlled) were excluded. These criteria were reflected on the medical clearance form provided to physicians. This study was approved by the university's institutional review board.

Self-efficacy to be physically active despite barriers (eg, when tired) was measured with a five-item Likert scale (1 = not at all confident to 5 = extremely confident).¹⁷ Responses across items were summed, and a mean score was obtained. The scale has good internal consistency, 0.76.¹⁷

The 12-item Self-efficacy for Exercise Behaviors Scale,¹⁸ revised from the

original version,¹⁹ was used to assess confidence in self-motivation to engage in physical activity. The questionnaire instructions, "Whether you exercise or not, please rate how confident you are that you could really motivate yourself to do things like these consistently, for at least six months," was applied to a range of behaviors (eg, exercise when social obligations are very time consuming). For each item, participants used a five-point Likert scale to indicate their level of confidence (1 = I know I cannot to 5 = I know I can). The scale yields two factors: "sticking to it" and "making time for exercise." Mean scores for each of the scales were generated. The various versions of the scale have been used in studies with Black women,^{20–23} with an internal consistency score of .95.²⁰ The original scale had adequate test-retest reliability (.68).¹⁹

Social support for exercise was assessed by the 13-item Social Support for Exercise Behavior scale²⁴ used previously in studies of middle-aged women.²⁵ In this study we omitted the three-item optional scale. Using a five-point Likert scale, participants reported the frequency that family and friends supported their physical activity, in the previous three months, with 1 = none to 5 = very often. This scale yields two social support scores: friend participation and family participation. Scores on each scale range from 10–50; higher scores reflect a greater degree of support. The scale has good reliability (alpha = .86).²⁴ This scale²¹ and a slightly modified version of this questionnaire were used previously with Black and other minority women.²⁶

Barriers to physical activity were measured with a 26-item scale.²⁷ As previous studies indicated that hair concerns could be a barrier to exercise participation for Black women,^{28–30} we added this item to the scale. Respondents used a five-point Likert scale to rate items from 0 = never to 4 = very often to indicate the degree to which

items interfered with being physically active. In a previous study,²⁷ 18 of the 26 items were submitted to a factor analysis to yield four factors: 1) aversiveness of activity (eg, exercise is boring) 2) inconvenience (eg, no convenient place); 3) worries (eg, I am too overweight); and 4) competing demands (eg, family demands, lack of money). In this study, we used an overall summed score across all 26 barriers and mean scores for each factor.²⁷

As previously described, stage of change to exercise was measured with the Physical Activity Stages of Change Questionnaire.¹⁷ Individuals were categorized into one of five stages: precontemplation, contemplation, preparation, action, or maintenance. Those in action and maintenance were regularly physically active. The scale has good test-retest reliability (.78).¹⁷

Behavioral and cognitive strategies used to support a physically active lifestyle were assessed with the 40-item Processes of Change Questionnaire (PCQ).¹⁵ For each questionnaire item, participants rated the extent to which they use various strategies. Scores for each strategy range from 0–4, where 0 = never to 4 = repeatedly. The scale yields scores for five behavioral processes (eg, seeking help from others to support physical activity) and five cognitive processes (eg, increasing knowledge about the benefits of physical activity). These scores were calculated by finding the average of four questionnaire items that correspond to each strategy. The scale has good reliability (alphas = .62–.89).¹⁵

Statistical analyses were performed using SAS version 9.0. Simple frequencies and means were used to summarize psychosocial and behavioral characteristics of the sample.

RESULTS

Sixty-one women participated in the study. The mean age of the sample was

Table 1. Psychosocial and Behavioral Characteristics of Study Sample

Construct	Mean ± SD	Example Questions
Self efficacy (n = 61)	2.72 ± .98	Exercise when: "I feel I don't have time"; "I am in a bad mood "
Self efficacy for exercise (n= 61)		
Sticking to it	4.01 ± .77	"Stick to good exercise program when undergoing a stressful life change "
Making time for it	4.05 ± .80	"Get up early even on weekends, to exercise"
Social Support		
Friend (n = 54)	17.39 ± 9.28	"Gave me encouragement to stick with my exercise program"
Family (n = 55)	18.66 ± 9.60	
Barriers (n = 61)		
Adversiveness of activity	1.26 ± .75	"Exercise is boring"
Inconvenience	1.88 ± .79	"No convenient place"
Worries	.97 ± .59	"I am too overweight"
Competing Demands	1.07 ± .89	"Lack of money"

50.48 ± 4.2 years. Women varied on level of education; <2% had less than a high school diploma; 8.9% were high school graduates; and the remainder had some college, were community/technical school college graduates, or had a bachelor's degree or greater. Fifty-five percent were unmarried, and 98% were employed full time. The mean body mass index indicated that participants were obese (35.97 ± 6.88 kg/m²). Resting blood pressure indicated that their blood pressure was controlled (133.28/78.21 ± 16.41/8.96 mm Hg). Regarding TTM staging, at baseline 92% of participants were in the pre-contemplation, contemplation, or preparation stages (88.52% of the sample was in the contemplation stage).

Participants were moderately confident in their abilities to overcome barriers to physical activity and to motivate themselves to engage in behaviors that would support being physically active (Table 1). With regard to social support, women had little social support for being physically active. Barriers seldom prevented women from participating in physical activity (mean 31.84 ± 13.11), and of the various barrier types, inconvenience type barriers were most likely to interfere with physical activity.

Women used strategies to differing extents; self-reevaluation (mean 2.79 ± .94) was the most frequently used cognitive strategy, and self liberation (mean 2.38 ± .91) was the most frequently used behavioral strategy (Table 2).

Table 2. Descriptive Statistics of Transtheoretical Processes of Change

Process	Mean ± SD
Cognitive Processes	
Consciousness raising	2.27 ± 1.15
Dramatic relief	1.91 ± 1.18
Self-reevaluation	2.79 ± .94
Environmental reevaluation	2.36 ± .97
Social liberation	1.92 ± .95
Behavioral Processes	
Helping relationships	1.38 ± 1.13
Reinforcement management	1.69 ± .96
Counter conditioning	1.73 ± .97
Stimulus control	0.95 ± .93
Self-liberation	2.38 ± .91

DISCUSSION

Using the SCT and TTM frameworks, this study examined the positive resources and potential areas of needs for insufficiently active, hypertensive Black women. Results suggest that interventions tailored for this population can build upon the moderately high levels of self-efficacy that these women present with, while encouraging the development of social support networks and greater use of behavioral strategies to encourage physical activity.

SCT maintains that behavior is the result of a reciprocal interaction among personal, environmental, and behavioral factors.¹¹ In this study we examined the SCT variables of social support, self-efficacy, and barriers. Across diverse populations, social support plays an important role in physical activity.^{23,31,32} However, only a few studies explore the role of social support for physical activity among Black women. Previous research indicated that Black women were discouraged from exercising by both friends and family.^{10,33,34} In the present study, participants received little social support for physical activity.

Results suggest that interventions tailored for this population can build upon the moderately high levels of self-efficacy that these women present with, while encouraging the development of social support networks and greater use of behavioral strategies to encourage physical activity.

Developing supportive social relationships will likely be an important component of physical activity interventions for this population. Moreover, recent research provides further direction on the aspects of social support that might be most important. For example, while some studies suggest that family and friend support is important for encouraging physical activity,²⁶ in a recent study³⁵ the frequency of friend but not family support was associated with leisure-time physical activity among Black women. A second consideration for intervention development is to ensure that we foster the type of social support that would be of most benefit. In a previous study, emotional support (eg, the extent to which people could be counted on to encourage women to be physically active) was significantly associated with physical activity among Black women. In contrast, neither instrumental support (eg, being able to count on individuals to exercise with) or informational support was related to physical activity.³²

Self-efficacy is an important correlate of physical activity across populations.³⁶⁻³⁸ Similar to prior studies,²⁰ hypertensive Black women in this study were moderately confident in their ability to overcome barriers to exercise and in their ability to engage in behaviors conducive to an active lifestyle. Using a general measure of self-efficacy, most Black women representing both rural and urban areas were "very confident" they could exercise more.³⁹⁻⁴¹ Taken together, results suggest that interventions build upon the strength of self-efficacy that Black women possess.

In contrast to reports that Black women have a broad range of barriers to physical activity,^{10,28-30,33,34,42,43} hypertensive Black women in the present study reported that obstacles rarely interfered with being physically active. While the current results differ from these primarily qualitative studies, results from our assessment of barriers are consistent with quantitative studies

conducted with African American participants.⁴⁴⁻⁴⁶ In one such study, 82% of participants with at least one barrier reported having no more than two obstacles to physical activity.⁴⁵ In another quantitative study that assessed 35 perceived barriers to physical activity, participants reported that barriers were encountered infrequently.⁴⁶ Understanding the influence of perceived barriers on physical activity (eg, reconciling the observation that 'lack of time' is a commonly cited reason for low physical activity with research indicating that 21.1% and 21.9% of American adults report watching television or videos or using a computer, outside of work, three hours per day and \geq four hours per day, respectively⁴⁷) is a key challenge for researchers. While both qualitative⁴⁸ and quantitative studies can inform this discussion, recent quantitative studies challenge us to consider factors beyond barriers that may have a greater effect on physical activity behavior.

The relative inactivity of Black women might be better understood by examining the transtheoretical processes of change. Conceivably, if Black women are not optimizing effective change strategies to support a physically active lifestyle, intervention programs that emphasize skill-building are likely to have the greatest effect. Similar to patterns among relatively sedentary Latina women⁴⁹ and insufficiently active White women,⁵⁰ of the cognitive processes of change, insufficiently active hypertensive Black women most frequently reflected on their personal values and its relationship to their behavior. They were least likely to react emotionally in response to warnings about the health hazards associated with inactivity or to notice how society supported physical activity, such as babysitting services at organized exercise locations or businesses offering time off to allow employees to exercise.

Regarding behavioral processes, Black hypertensive women were most

likely to commit to being physically active as a strategy to encourage exercise, a finding consistent in White women.⁵⁰ However, among a primarily Latina sample, rewarding oneself was the behavioral strategy most endorsed.⁴⁹ Similar to the work on relatively sedentary White and Latina women,^{49,50} Black women in our study rarely used reminders or cues around the environment or relied on helping relationships to support their physical activity endeavors. Overall, our study participants employed cognitive strategies to a greater extent than their use of behavioral strategies. Interventions for promoting physical activity in this population should make behavioral skill training a priority.

One limitation of our study was our modest sample size. Nonetheless, our assessment of a range of theoretically based constructs provides important information on the characteristics of this population. A second limitation is that our university-based volunteer sample may not be representative of hypertensive Black women in general. A replication of this study with a community-based population would be the next step. A third limitation is that five participants indicated they were in the more "active" stages of physical activity at the baseline survey. These women were included in data analysis because they had met criteria during initial telephone screening. A lapse between the screening questionnaire and initiation of the baseline assessment (for example, due to scheduling difficulties) provided an opportunity for some women to increase their level of activity. A fourth limitation is that some measures (eg, the Processes of Change Questionnaire) appear to have limited use in Black populations; future studies should continue to evaluate its use in diverse groups.

This study also makes important contributions. First, it examines constructs from both SCT and TTM, two theories with strong evidence for phys-

ical activity promotion, among a population for which there is little information with regard to these theoretical constructs. As noted by other researchers,²³ the effectiveness of physical activity interventions designed specifically for African-American women is not known. Our study can provide some direction to the development of effective interventions. Study results challenge researchers to develop effective ways to build social support for physical activity for hypertensive Black women and maintain their initial levels of confidence to engage in behaviors that will support a physically active lifestyle. Perhaps most interesting in our study was the apparent lack of barriers that would impede a woman's ability to be physically active. It will be important to consider alternative models that could explain the lower levels of activity in this population. Exploring how hypertension may impact physical activity may offer some insight. For example, the belief among some African Americans that medication is the only way to control high blood pressure⁵¹ or the belief that effective ways to treat hypertension include vitamins and herbs⁵² may influence the degree to which women choose to be active. Additionally, Black women who perceived their health to be good or excellent also reported higher levels of self-efficacy,⁵³ suggesting that health status variables can affect self-efficacy, which in turn influences physical activity behavior.

A second strength lies in our focus on women. Gender differences exist in physical activity.^{32,38} Importance should be placed on carefully examining factors influencing the relationship between physical activity and gender. A third strength relates to our focus on a specific developmental period, namely, the mid-life period for women. Many health concerns that can be prevented or ameliorated by physical activity occur in mid-life.⁵⁴⁻⁵⁶ In addition, research suggests that barriers to physical activity vary

by age group.⁴⁵ Because adulthood has several developmental periods, understanding factors related to physical activity at different points in the lifespan will continue to be an important aspect of physical activity research.

Our study findings also have implications on recruitment. Similar to previous work⁵⁷ passive recruitment strategies (ie, flyers and newspapers) were effective in engaging women in our program. Investigators offering similar programs through the worksite may also find such low-cost recruitment methods to be sufficient to attract women who are ready to become physically active.

In summary, insufficiently active Black hypertensive women present with many positive resources that may facilitate the adoption of a regular program of physical activity. These include a moderate level of confidence to overcome barriers, a moderate level of confidence to motivate themselves to engage in behaviors that support a physically active lifestyle, and they report that barriers rarely interfere with their ability to be physically active. To further support this population, interventions should focus on developing social support networks and teaching a variety of behavioral strategies important to the adoption of an active lifestyle.

ACKNOWLEDGMENTS

We would like to thank Diane Williams at the University of Alabama at Birmingham for her assistance in preparing the document. This study was funded by NICHD (K12HD01402).

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Statistical expertise: Prayor-Patterson, Kratt, Kim, Person

Acquisition of funding: Martin

Administrative, technical, or material assistance: Martin, Prayor-Patterson, Kratt

Supervision: Martin