Jackson Heart Study Manuscript Proposal Form

Please read JHS Publications & Presentations protocol before completing this proposal.

JHS MS # 0196

Date of Submission: Revised 09/30/2009 **Date of Approval: ___**

PART I. OUTLINE OF PAPER

1. Title Information

a. Proposal Title: Gender Differences in Coping Strategies and Blood Pressure in African Americans: The Jackson Heart Study

b. Abbreviated Title: Emotion/Problem-Focused Coping

c. Suggested key words: Emotion-Focused Coping (EFC), Problem-Focused Coping (PFC), African Americans (AA), Jackson Heart Study (JHS)

2. Lead Author Name: Sandra H. Williams MSN, PhD Candidate **(Dissertation)**

Institutional Affiliation**:** The University of Tennessee Health Science Center

Address: 920 Madison, Suite 507N

Memphis, TN 38163

Telephone: 901-448-1176 Fax: 901-448-1762

Email: swilli61@utmem.edu

3. Co-authors, Contact Information, and Responsibilities:

Name	Contact Information	Responsibilities
Ann K. Cashion PhD, RN, FAAN	Chair and Professor Acute and Chronic Care Department 920 Madison, Suite 507 N University of Tennessee Health Science Center Memphis, TN 38163 901.448.1176 (office) acashion@utmem.edu	Primary Content Reviewer Dissertation Committee Chair
Frances C. Henderson Ed.D, RN	Deputy Director, Jackson Heart Study Professor of Medicine 350 Woodrow Wilson Drive, Suite 701 Jackson, MS 39213 601.979.8765 (office) fhenderson@medicine.umsmed.edu henfra@att.net	JHS Mentor, Content Reviewer Ad Hoc Dissertation Committee Member
J. Carolyn Graff PhD, RN, FAAIDD	Associate Professor of Primary and Public Health College of Nursing PhD in Nursing Program, Director Chief of Nursing, Boling Center for Developmental Disabilities University of Tennessee Health Science Center 711 Jefferson Avenue Memphis, Tennessee 38105 901.448.6544 (office) jgraff@utmem.edu http://www.utmem.edu	Theoretical/Conceptual Framework Content Dissertation Committee Member
Mona N. Wicks PhD, RN	Professor and Associate Dean for Research Primary Care and Public Health Department Robert Wood Johnson Executive Nurse Fellow 877 Madison Avenue Memphis, Tennessee 38163 901.448.6250 (office) mwicks@utmem.edu	African American Health Content Dissertation Committee Member
Patricia D. Cunningham, PMNP/CNS-BC, FNP-BC, APN	Psychiatric Option Coordinator and Associate Professor Primary Care and Public Health Department 877 Madison Avenue # 612 Memphis, Tennessee 38163 901. 448.6103 (office) pcunningham@utmem.edu	Cardiovascular Disease Content Dissertation Committee Member
Donna S. Husch PhD, Statistician	Adjunct Faculty Statistics, Operations, and Management Science 331 SMC, 916 Volunteer Blvd. Knoxville, TN 37996-0532 865- 974-4116	Data Analysis Content Dissertation Committee Member

4. **Signature Sheet for Manuscript Proposal:** Attached

5. Relevant JHS Investigators: Frances Henderson, JHS Investigator/Mentor

6. Background/Rationale:

Stressful life events within the African-American community are well documented and ineffective coping with these life events is thought to lead to increased blood pressure [1]. The prevalence of hypertension in African Americans has been found to be as high as 62.9%[2]. Unfortunately, there is little available information about the use of coping strategies in the African American community and even less information on how these strategies may be associated with blood pressure (BP). In times of stress, individuals choose their coping strategy based on their perception or appraisal of the situation [3, 4].

The Jackson Heart Study (JHS), a population-based epidemiological study of cardiovascular disease, includes longitudinal data that can help elucidate the association between coping strategies and blood pressure in African Americans [5]. Jackson Heart Study investigators categorized coping strategies into four groups that are determined by the type of engagement strategy used by participants and by the target of the coping effort. There are two engagement strategies–approach-related (assumed to limit the long-term negative consequences of stress) and disengagement-related (assumed to lead to poor long-term health consequences). The target of the coping effort can be categorized as either problem-focused (emphasizes management of the stressful situation) or emotion-focused (emphasizes the regulation of one's affective response)[3]. Variation in coping strategies may explain differences in blood pressure in African Americans.

Stress leading to the need to cope has many different antecedents. Along with racial discrimination, environmental, psychosocial, job, and family related stressors exist in the African American community [6-8]. For example, environmental stressors may include gang activity and street harassment, while psychosocial stressors may include family obligations and racial discrimination [9]. Job related stress is associated with coping strategies that can include increased alcohol consumption and tobacco usage, changes in dietary habits, and decreased physical activity; all of which can lead to increased blood pressure [10]. Investigators have also found significant positive associations between blood pressure and family life stress, anxiety, and depression [11]. Many African Americans have chronic stress and as a group have a higher prevalence of hypertension than other racial groups. Unfortunately, there is little information regarding the associations of blood pressure and coping strategies among African Americans. Inclusion of African American participants in research studies of coping strategies and cardiovascular risk should be the norm instead of the exception[12].

The JHS, funded by the National Heart, Lung, and Blood Institute (NHLBI) and the National Center on Minority Health and Health Disparities (NCMHD) of the National Institutes of Health (NIH), is based in the Metropolitan Statistical Area of Jackson, Mississippi. Although the focus of the JHS is on cardiovascular disease risk factors, understanding the role of coping in African American communities is included as one of several factors that may hold a key to the prevention and treatment of hypertension in African Americans living in the south [13].

Purpose

The purpose of this study proposal is to identify and characterize participants enrolled in the JHS by gender based on systolic and diastolic blood pressure and to examine differences among the groups related to coping strategies, age, socioeconomic status (SES), alcohol consumption, tobacco usage and physical activity.

Coping Strategies

Lazarus describes coping strategies as either passive or active; approach or avoidance; engagement or disengagement; or problem- or emotion-focused [14]. Passive strategies such as avoidance and disengagement usually refer to emotion-focused coping strategies and approach and engagement strategies usually refer to active coping strategies [15]. Problem-focused coping is management of stressors whereas emotion-focused coping is regulation of emotions during stressful life events [3]. When using passive coping, an individual has a tendency to feel they cannot adequately manage or control situations, which leads to disengagement, avoidance, and denial of the stressful events. In active coping, an individual feels challenged by stressor(s) and becomes actively engaged in resolving stress-producing situations.

Jackson Heart Study investigators modified the original Coping Strategies Inventory (CSI) to develop a Coping Strategies Inventory-Short Form to measure coping strategies in study participants. Psychometric testing of the Coping Strategies Inventory-Short Form (CSI-SF) conducted by the JHS revealed the following four subscales 1) problem-focused engagement; 2) problem-focused disengagement; 3) emotion-focused engagement; and 4) emotion-focused disengagement[16]. The CSI-SF categorized coping efforts as engagement (approach-related) strategies and disengagement (avoidant) strategies[16]. Avoidant, wishful thinking, and self-criticism coping comprise disengagement strategies whereas problem-solving, cognitive restructuring, seeking social support, and expressing emotions comprise engagement coping strategies[17]. Problem-engagement strategies (cognitive restructuring and problem-solving) are typically used to help manage stressors and problem-disengagement strategies (wishful thinking and avoidance) are efforts made to avoid confronting stressors[17]. In contrast, emotion engagement consists of expressed emotions and social support whereas emotion disengagement consists of social withdrawal, self criticism, and self blame[17].

The confrontational actions of engagement approach strategies significantly limit long-term psychological and physiological environmental stressors. In contrast, the focus of disengagement avoidant strategies are to minimize exposure to the stressful event causing minimal positive effects thus potentiating long-term negative health outcomes[16]. During JHS Exam 1, participants were instructed to indicate how they handle or cope with stress. Participants then selected the item that showed how often they coped with stress in that way. Choices included “never”, “seldom”, “sometimes”, “often”, and “almost always” ranging from numbers 1-5[16]. “I make a plan of action and follow it” measured as a problem-focused disengagement strategy [16], and as active planful problem-solving by the Ways of Coping for African American women (WOCAA) [18], Ways of Coping (WOC) [19] and the Coping Orientation to Problems Experienced (COPE) Scale [15].

The statement "I try to talk about it with a friend or family" is an example of problem-focused engagement according to the CSI-SF and "I talk to someone who could do something helpful about the problem" illustrates an active coping strategy as measured in the (COPE) instrument[15]. Assessment of avoidant passive (emotion-focused) strategies is measured in the CSI-SF by statements such as "I try to spend time alone"; "I tend to blame myself" and "I tend to criticize myself" (emotion-focused disengagement). "I hope the problem will take care of itself", "I try to put the problem out of my mind", and "I hope for a miracle" are illustrative of emotion-focused engagement[16]. In a study of 162 African American adults, findings showed that emotion-focused coping was strongly related to socioeconomic status (β=.46, p<.001) and chronic stress emotions (β=−.89, <.001), but not with BP (β=.11, p<.003) [20]. Chronic and prolonged stress has long potentiated inappropriate behaviors and ineffective coping strategies evidenced by high-level alcohol and drug abuse, physical inactivity, and increased tobacco use in the African American community.

Coping and Blood Pressure

Cardiovascular effects of ineffective coping include increased diastolic blood pressure (DBP) during passive coping and increased systolic blood pressure (SBP) during active coping[14]. Active coping strategies result in increased β-adrenergic vasodilatation activity such as increased catecholamine levels and increased blood pressure via cardiac mechanisms, e.g., increased cardiac output and stroke volume[21]. In contrast, use of passive coping strategies increases α-adrenergic vasoconstriction activity resulting in decreased changes in catecholamine and elevated blood pressure via vascular or peripheral mechanisms. JHS investigators examined hypertension (HTN) prevalence, and found an overall prevalence rate of HTN of 62.9% in a sample of men (n=1154) and women (n=2148) aged 21-94 [22]. In another study investigators examined self-disclosure and emotion-focused and problem-focused coping strategies among men with borderline hypertension and found that men who had more blood pressure changes used less self-disclosure and less emotion-focused coping than men who had no blood pressure changes [23].

Coping and Gender

Lazarus and colleagues suggested that men use more problem-focused coping than women, especially in work related situations[3]. Results of studies indicate that gender is associated with specific coping strategies [3, 24, 10, 23, 25, 26]. Coping strategies of African American individuals are resiliency, spirituality and collectivity [8, 27]. In African American men, avoidant (passive) coping strategies have been found to be predictive of drug use [24] and in African American women, there appears to be a tendency to minimize problems in an effort to appear resilient and strong [8]. In a study of one hundred White protestants (n=48 men, n= 52 women), men tended to use more problem-focused coping than women with no gender differences noted in emotion-focused coping[3]. Problem-focused coping buffers the psychological effects of chronic stressors in African American females but exacerbates the psychological effects in African American men. Analysis of blood pressure and psychological coping in 158 Italian men and women revealed an inverse relationship between emotion-focused coping and BP in men only. Data showed evidence of an association between the search for external support and higher BP in men only.

Emotion-focused engagement (confrontational) coping was found to be used more often in normal weight African American women than in over weight and obese African American women ([*chi*]^2*=24.024;p=.0001]*), which is indicative of better weight control when confronting problems directly[28]. Approaching adverse situations directly, a problem-focused coping strategy, is a known characteristic of men historically and emotional expression, a emotion-focused coping strategy, is common in women[3]. Religious coping is a well-known strategy used by many among African American women seeking relief from stressful events– they often seek support by praying to God and attending church. The general belief is that men in the African American community, however, typically do not seek social support from sources outside of themselves and usually use problem-solving coping strategies[29]. At times, many African American men grow tired of the myriad of social injustices and escape using drugs, alcohol, gangs, and smoking cigarettes. These approaches contribute to increased cardiovascular risks for hypertension.

Potential Co-variants of Coping Strategies

In the current study, potential co-variants of coping will include age, socioeconomic status (e.g., income and education), alcohol consumption, tobacco use, and physical activity. Emotion-focused avoidant coping strategies adversely affect cardiovascular health outcomes. Drug use, low self-esteem, and low levels of social support may be predictive of emotion-focus coping. In contrast, the absence of drug use, higher self-esteem, and more social support are thought to be predictive of problem-focused coping [30].

A study investigating the affects of work stress on resting blood pressure and indirect effects mediated by coping and lifestyle in an Australian sample of men (n=337) and women (n=317) found that men had higher blood pressures and demonstrated maladaptive coping (e.g. alcohol/drug abuse, smoking, binge eating, interpersonal withdrawal) and exercised more. Comparatively, women used more adaptive coping strategies (e.g. exercising, relaxing, seeking external social support, or organizing work time better)[10]. The Coping Orientation to Problems Experienced (COPE) questionnaire was used to assess the specific coping styles of 608 Setswana-speaking African male (n=269) and female (n= 339) participants of the Transition and Health during Urbanization in South Africa (THUSA) study. The participant ages ranged from 16-70 years old. Overall findings showed men reporting more alcohol consumption and physical activity with increased heart rate and women having higher hypertension prevalence values[31].

Summary

There is very limited information about coping strategies used by African American men and women when faced with day-to-day stress. However, studies have shown that problem-focused coping is an adaptive coping strategy used more often by men than women and produces positive health outcomes. In contrast, emotion-focused coping is a more maladaptive coping strategy used more often by women [32-34]. Emotion-focused coping is also a predictor of higher blood pressure and hypertension. Lazarus and colleagues postulated that individuals constantly evaluate their transactions with their environment. Transactions (i.e., work, family, personal, health related events) are appraised as threatening, harmful or challenging followed by either regulation (emotion-focused coping) or management (problem-focused coping) of the event [35]. The proposed study seeks to evaluate whether or not there are differences in coping strategy choices among adult men and women enrolled in the JHS.

In primarily non-African American populations, investigators report that emotion-focused coping is a predictor of low self-esteem, limited social support, increased alcohol consumption, avoidant behavior, and elevated diastolic blood pressure. By contrast, problem-focused coping is predictive of better self-esteem, more social support, less alcohol consumption, and higher systolic blood pressure. Additionally, men use more problem-focused coping in the workplace and no gender-differences exist for emotion-focused coping. A significant gap in coping research exists because African American participation in this area of research has been limited. However, the proposed study seeks to provide insights into whether or not coping strategies are associated with blood pressure anomalies and hypertension by investigating gender differences in coping among JHS participants. This information could provide useful insights about the relationship between coping and blood pressure and could be useful in developing interventions to combat hypertension in African Americans. The proposed study also seeks to contribute to cardiovascular disease reduction efforts by elucidating the association between coping strategies and blood pressure in individuals participating in the Jackson Heart Study. Identification of effective and ineffective coping strategies and teaching effective strategies could be an important, low-cost approach for preventing and reducing the prevalence of hypertension among African Americans living in the southeast region of the US.

Specific Aims:

Aim 1: To identify and characterize subgroups of African Americans enrolled in the JHS based on systolic and diastolic blood pressure.

1. a. To characterize African American females enrolled in the JHS based on systolic and diastolic blood pressure.
1. b. To characterize African American males enrolled in the JHS based on systolic and diastolic blood pressure.

Aim 2: To determine differences in coping strategies, age, gender, socioeconomic status, alcohol consumption, tobacco usage and physical exercise among subgroups categorized by systolic and diastolic blood pressure.

7. **Research Hypotheses**:

H1: African American women compared with men will have higher emotion-focused disengagement, lower physical activity levels, and lower systolic and higher diastolic blood pressure.

H2: African American men compared with women will have higher problem-focused disengagement, higher physical activity levels, higher systolic blood pressure and lower diastolic blood pressure.

H3: African American women compared with men will have lower problem-focused engagement, decreased alcohol consumption, and decreased tobacco use.

H4: African American men compared with women will have lower emotion-focused engagement, increased alcohol consumption and increased tobacco use.

Conceptual Framework

This proposal will investigate coping strategies and their affect on cardiovascular health status in African Americans enrolled in the JHS. Coping can affect health outcomes negatively when an individual uses unhealthy coping strategies such as excessive alcohol consumption and cigarette smoking. These unhealthy behaviors, which when used to decrease stress, can result in increased cardiovascular morbidity risks[35] for the individual. The Model for Studying Racial Differences in Health[6] (Figure 1), developed by Dr. David Williams, a well-known African American sociologist, was used to guide JHS investigators' collection of sociocultural data [36] and will be adapted for the proposed study. The sociocultural aspects of Williams' model facilitated capture of cultural and social influences on health outcomes in the African American community using the following concepts: 1) basic causes; 2) social status; 3) surface causes; 4) biological processes, and 5) health status. The model describes two classifications of race-associated causes for changes in health status; basic and surface causes. Health changes originate from basic causes such as culture, economic, geographic, political and legal factors [6]. Coping strategy from a cultural perspective is the basic cause under consideration in this proposal.

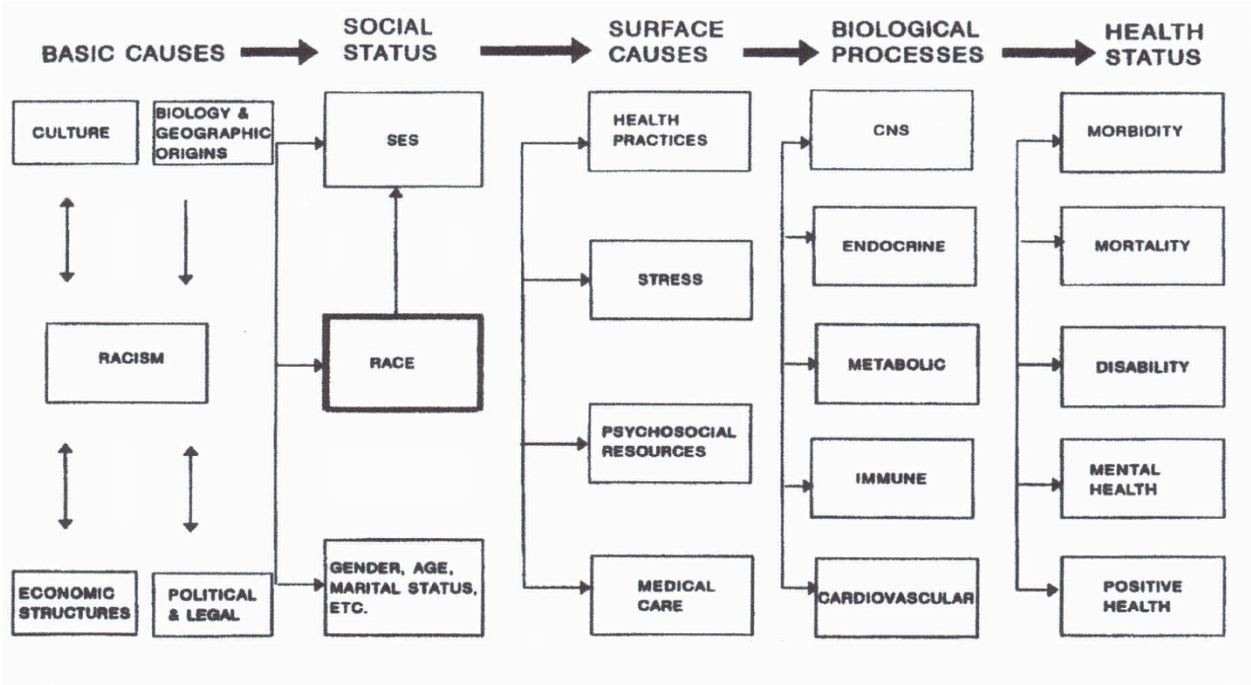

Figure 1: Conceptual model guiding protocol development and analysis strategies, adapted from Williams[6].

Coping is the attempt to manage alterations in the person-environment relationship across time. Individuals tend to appraise stressful transactions as being threatening, challenging, or harmful. Coping processes are then implemented to either regulate emotions or manage problems leading to either favorable or unfavorable outcomes[35]. Therefore, basic causes for the proposed study consist of coping processes from a cultural prospective and are the independent variables under investigation in the current study.

The evaluation of cultural processes in the proposed study will provide insight into how African American participants enrolled in the JHS cope with stressful events. The social status section in Williams' model include the following: socioeconomic status (e.g., income and education), gender, and age which interact with other conditions to produce the outcome of interest[37]. These variables will be moderator variables in the current proposal. In Williams' model, the surface causes include the concepts of health practices, stress, psychosocial resources and medical care. For this proposal, the surface cause variables will include variables from the concept of health practices (i.e., alcohol consumption and tobacco use) and psychosocial resources (i.e., problem-focused and emotion-focused engagement and problem-focused and emotion-focused disengagement). The health practice and psychosocial resource variables are moderator variables because they can potentially change the relationship between coping and blood pressure during coping events. Williams' model included five concepts under biological process. For this study, the primary biological process concept will be blood pressure, which is embedded in the concept of cardiovascular biological processes. Coping strategies, which are situation-dependent, can affect systolic and diastolic blood pressure and can adversely affect cardiovascular health.

Coping moderates environmental stress and physiological response relationships leading to negative health outcomes[38]. For this study, health status will be defined as hypertension (within the concept of morbidity). For example, the impact of hostile encounters on physiological functioning can be modified by defensive or emotion-focused coping[39, 40] and problem-focused coping has resulted in less hypertensive symptoms[16]. Therefore, for this proposal, variables from each of Williams' major concepts will be evaluated and their association with hypertension will be of primary interest. Below is a brief description of the major concepts and variables of interest.

Basic Causes

The basic causes are usually components that help establish the outcome of interest. Changes in these components usually change outcomes. The basic causes under consideration in the present study consist of the context of coping, cultural processes and their affect on blood pressure in African Americans enrolled in the JHS. The study will focus on gender differences in coping strategies and potential blood pressure changes related to type of coping strategy employed by JHS participants.

Social Status

Measures of socioeconomic status in the proposed study include income and education, gender, and age. The JHS database includes each of these measures of socioeconomic status as well as marital status and occupational role. Because all participants will be African-American, race will not be a variable in this proposal.

Surface Causes

The current study will focus on health practices and psychosocial resources, two of the four surface causes in Williams' model, Alcohol consumption, tobacco use, and physical activity level will be evaluated as health practices. In addition, problem-focused and emotion-focused coping, engagement and disengagement coping will be evaluated as psychosocial resources [36].

Biological Processes

Payne and colleagues evaluated all five biological processes, CNS, endocrine, metabolic, immune, and cardiovascular[36]. The biological variable of interest for the current study is the cardiovascular process, specifically systolic and diastolic blood pressure.

Health Status

Studies have shown that coping efforts can positively or negatively affect health status. Using ineffective coping strategies can increase neurochemical reactions and result in increased blood pressure and higher morbidity. For example, drinking smoking tobacco, and using illicit drugs to cope can increase mortality and morbidity. In addition, using emotion-focused coping strategies like denial or avoidance which can impede adaptive health/illness-related behavior [35]. Therefore, for this proposal, the primary health status concept of interest is hypertension.

Study Significance

The overall significance of this proposed study is that information obtained will provide insight on ways in which African American men and women cope and whether or not specific coping strategies positively or negatively contribute to elevated blood pressure and hypertension in African Americans. Findings from this study will contribute to the JHS's objective to identify genetic, biological, and environmental risk factors for development and progression of cardiovascular disease in African American men and women. Increased knowledge of the ways in which African Americans cope could facilitate intervention development as well as future research focused on the reduction of blood pressure in African Americans [1].

8. Data: JHS Examination 1 Data

Design

A secondary database analysis will test hypotheses. This study design will focus on the relationship of coping strategies by gender with measures of blood pressure and total scores for alcohol consumption, tobacco use, physical exercise, socioeconomic status (e.g., income and education), and age. Baseline data were collected during examination 1 as part of the larger JHS cohort. Dependent variables include hypertension, and systolic and diastolic blood pressure; independent variables include CSI-SF total scores, emotion-focus coping total scores, problem-focused coping total scores, problem-focused engagement, problem-focused disengagement, emotion-focused engagement and emotion-focused disengagement total scores, total physical activity scores, age, sex, socioeconomic status (indicating income and education), alcohol consumption, and tobacco use total scores. Systolic blood pressures $\geq$ 140 mm Hg and diastolic blood pressures $\geq$ 90 mm Hg defined hypertension in the current study[2].

Sample

A sample of 5301 African American men and women residing in Jackson, MS, was recruited from September 2000 to March 2004 to participate in the JHS, but only 4315 participated in the sub-study that assessed the psychometric properties of the CSI-SF [13]. The initial inclusion age for the JHS was 35-84 but was modified to include relatives <35 and >84 who were a part of the imbedded Family Study, resulting in a final age range of 21 to 94 years [22]. Inclusion criteria consist of all men and women participating in the JHS between 2000 and 2004 who completed the CSI-SF and for whom systolic and diastolic data are available. Exclusion criteria consist of history of psychiatric illness, terminal illness and dialysis.

Measure of Problem-Focused and Emotion-Focused Coping Responses

The Coping Strategies Inventory Short Form, a four-factor 16-item instrument was developed to measure coping responses in the JHS cohort and was administered and completed by 1508 men and 2807 women totaling 4,315 participants, including headache sufferers, patients with coronary heart disease, and caregivers of Alzheimer's patients[41]. Each participant was given the CSI-SF at the conclusion of the home induction interview (HII) as part of the Approach to Life booklet in the Bring to Clinic section[41] and instructed to complete and return the form at the next clinic visit. The CSI-SF has a two-level subscale format.

The first level consists of two subscales- engagement and disengagement and the second level consists of the following four subscales: problem-focused engagement (PFE), problem-focused disengagement (PFD), emotion-focused engagement (EFE) and emotion-focused disengagement (EFD) [16]. Each item was evaluated using a 5-point Likert Scale that ranged from 1 (never), 2 (seldom), 3 (sometimes), 4 (often), and 5 (almost always). Scoring consisted of summarized responses to items contained in each subscale with minimum scores ranging from 4 to 20[41]. Reliability for each subscale ranged from marginal to acceptable. Cronbach's alpha-reliability was 0.59-0.70 for the engagement and disengagement scales and 0.58-0.72 for subscales PFE, PFD, EFE and EFD[16]. The table below provide examples of coping strategy subscale items[13, 41]:

Dimension	Items	Example
Problem-focused Approach	1,2,8,9	I make a plan of action and follow it
Problem-focused Avoidance	4,7,12,14	I hope the problem will take care of itself
Emotion-focused Approach	5,6,11, 13	I try to talk about it with a friend or family
Emotion-focused Avoidance	3,10,15,16	I tend to blame myself

Table 1: Coping Strategies Inventory Subscales with examples

Measure of Sitting Blood Pressure (SBPA form)

Blood pressure was measured using a Hawksley random zero sphygmomanometer and cuff size was determined by arm circumference and appropriately applied by trained personnel. Two blood pressure measurements taken 1-minute apart were averaged and recorded. For this proposal, BP will be analyzed as diastolic blood pressure, systolic blood pressure, and hypertension[22]. The blood pressure variable of interest is BP701, which was derived from JNC 7 BP Classification[42]. The variable HTN017 will be used for hypertension status in the proposed study and is defined as blood pressure ≥ 140/90mmHg and use of blood pressure lowering medication (actual or self reported) within 2 weeks prior to clinic visit[42].

Measure of Physical Activity (PACA form)

The PACA 30-item questionnaire assessed active living, work, sport, and home and family life. Participants were asked to respond to a combination of yes/no and 5-point Likert-type questions[43]. Physical activity variables include total scores from the: 1) ACL01-active living index, 2) the WRK01A-work index, 3) the SPT01-sport index and 4) the HFY01-home and family life index. The sum of the four index scores comprise the physical activity total score[2].

Measure of Tobacco Use (TOBA form)

The Health Practices: Tobacco Use tool assessed environmental tobacco smoke exposure and nicotine dependence for participants who smoked cigarettes. The TOBA form included 29 questions related to cigarettes, pipes, cigars, chewing tobacco and dip/snuff. For this study proposal, the variables will be yes/no: (whether or not have smoked at least 400 cigarettes in lifetime; started, current smoking status; how long has it been since smoked last in months and years; number of cigarettes)[43].

Measure of Alcohol Consumption (ADRA form)

Alcohol and drug use was measured using the Health Practices: Alcohol and Drug Use form, which consisted of five alcohol consumption, related items and three drug-use items. The 8-item instrument consists of a combination of yes/no, fill-in the blank and Likert-type questions. Alcohol consumption variables for the proposed study consists of: 1) ALC01-alcohol drinking in the past 12 months (yes or no); 2) ALC01C1- alcohol drinking classification I (based on number of drinks per week); 3) ALC1C2- alcohol drinking classification II (based on the number of drinks per day, age and gender)[44].

Measure of Demographic/Socioeconomic Data (PDSA form)

Demographic information such as birthplace and marital, educational, employment, and retirement status was derived from the 32 item Personal Data: Socioeconomic form. For the proposed study, derived variables PDSA18a and PDSA18b will be used for education level and PDSA28a-PDSA28g will be used for income level and AGE01H1 for age at home induction interview, based on birth date and date of interview[44].

9. Brief Statistical Analysis Plan and Methods:

Statistical Analysis

This is a secondary analysis of selected data from the larger community based, observational Jackson Heart Study. The Institutional Review Boards of Jackson State University, the University of Mississippi Medical Center, and Tougaloo College approved the JHS. Approval to conduct the proposed study will be obtained from the Institutional Review Board of the University of Tennessee Health Science Center. This study will focus on the relationship of coping and gender with blood pressure, alcohol consumption, tobacco usage, and physical activity using SPSS version 17.0 to conduct descriptive statistics, hierarchical cluster analysis, and analysis of covariance (ANCOVA). Descriptive statistics will be used to obtain measurement summary data. Hierarchical cluster analysis allows the researcher to identify similar and dissimilar group observations. Similar groups in the same clusters are compared to dissimilar groups [45].Therefore, hierarchical cluster analysis will be used to determine whether or not men and women enrolled in the JHS can be grouped based on systolic and diastolic blood pressure. The goal will be to identify groups of participants similar to each other on the following CSI-SF coping scales: problem-focused engagement, emotion-focused engagement, problem-focused disengagement, emotion-focused disengagement, engagement and disengagement coping strategies. Participant subgroups will be compared with one-way ANCOVA on age and Pearson's chi squared and Fischer exact tests will be used to compare clusters on gender, alcohol consumption, tobacco use, and physical activity, emotion-focus coping total scores, problem-focused coping total scores, total scores for the following subscales-problem-focused engagement, problem-focused disengagement, emotion-focused engagement and emotion-focused disengagement with blood pressure [45]. Multiple regression analysis will be used to determine whether there are independent effects of gender and problem-and emotion-focused engagement, problem- and emotion-focused disengagement on blood pressure. Bonferroni post hoc comparisons will be used to examine significant effects to control Type 1 error [46]. To prevent Type 1 error, α (alpha) is decreased for each test (α_i) for an overall α =0.05. The Bonferroni method (where $\alpha_i = \alpha / N$ if N is the total number of tests performed)[47] is known to be the easiest to understand[47] and has been used in coping research[48, 49].

10. References:

1. Malan, L., et al., *Coping mechanisms, perception of health and cardiovascular dysfunction in Africans.* International Journal of Psychophysiology, 2006. **61**(2): p. 158-166.
2. Wyatt, S., Akylbekova, E., Wofford, M., Coady, S., Walker, E., Andrew, M., Keahey, W., Taylor, H., & Jones, D. , *Prevalence, awareness, treatment, and control of hypertension in the Jackson Heart Study.* Hypertension, 2008. **51**: p. 650-656.
3. Folkman, S. and R.S. Lazarus, *An Analysis of Coping in a Middle-Aged Community Sample.* Journal of Health and Social Behavior, 1980. **21**(3): p. 219-239.
4. Folkman, S., et al., *Dynamics of a stressful encounter: Cognitive appraisal, coping, and encounter outcomes.* Journal of Personality and Social Psychology, 1986. **50**(5): p. 992-1003.
5. Taylor, H., *Establishing a foundation for cardiovascular disease research in an African-American community-The jackson heart study.* Ethnicity & Disease, 2003. **13**: p. 411-413.
6. Williams, D.R., *Race and health: Basic questions, emerging directions.* Annals of Epidemiology, 1997. **7**(5): p. 322-333.
7. Daly, A., et al., *Effective coping strategies of African Americans.* Social Work, 1995. **40**(2): p. 240-248.
8. Thomas, A.J., K.M. Witherspoon, and S.L. Speight, *Gendered racism, psychological distress, and coping styles of African American women.* Cultural Diversity and Ethnic Minority Psychology, 2008. **14**(4): p. 307-314.
9. Artinian, N.T., et al., *Depression, stress, and blood pressure in urban African-American women.* Progress in Cardiovascular Nursing, 2006. **21**(2): p. 68-75.
10. Lindquist, T.L., L.J. Beilin, and M.W. Knuiman, *Influence of Lifestyle, Coping, and Job Stress on Blood Pressure in Men and Women.* Hypertension, 1997. **29**(1): p. 1-7.
11. Russell, M., et al., *A Longitudinal Study of Stress, Alcohol, and Blood Pressure in Community-Based Samples of Blacks and Non-Blacks.* Alcohol Research & Health, 1999. **23**(4): p. 299.
12. Rutledge, T. and B.E. Hogan, *A Quantitative Review of Prospective Evidence Linking Psychological Factors With Hypertension Development.* Psychosom Med, 2002. **64**(5): p. 758-766.
13. Addison, C., Campbell-Jenkins, B., Sarpong, D., Kibler, J., Singh, M., Dubbert, P., Wilson, G., Payne, T. & Taylor, H., *Psychometric evaluation of coping strategies inventory short-form (CSI-SF) in the Jackson heart study cohort.* International Journal of Environmental Research and Public Health, 2007. **4**((4)): p. 289-295.
14. Malan, L., Schutte, A.E., Malan, N.T., Wissing, M.P., Vorster, H.H., Steyn, H.S., et al. , *Coping mechanisms, perception of health and cardiovascular dysfunction in Africans.* International Journal of Psychophysiological, 2006. **61**(2): p. 158-166.
15. Carver, C., Scheier, M. & Weintraub, J., *Assess coping strategies: A theoretically based approach.* Journal of Personality and Social Psychology, 1989. **56**: p. 267-283.
16. Addison, C., Campbell-Jenkns, B., Sarpong, D., Kibler, J., Singh, M., Dubbert, P., Wilson, G., Payne, T. & Taylor, H., *Psychometric evaluation of coping strategies inventory short-form (CSI-SF) in the Jackson Heart Study cohort. International Journal of Environmental Research and Public Health* (2007). ***4***(*4*): p. 289-295.

17. Tobin, D., Holroyd, K., Reynolds, R., Wigal, J., *The hierarchical factor structure of the coping strategies inventory. Cognitive Therapy and Research*, 1989. ***13***(*4*): p. 343-361.
18. Smyth, K.Y., H., *Factor analysis of the ways of coping questionnaire for African American women. Nursing Research*, 1996. **45**(1): p. 25-29.
19. Folkman, S., Lazarus, R., Dunkel-Schetter, C., DeLongis, A., & Gruen, R., *Dynamics of a stressful encounter: Cognitive appraisal, coping, and encounter outcomes. Journal of Personality and Social Psychology*, (1986). **50**(5): p. 992-1003.
20. Peters, R., *The relationship of racism, chronic stress emotions, and blood pressure Journal of Nursing Scholarship*, 2006. **38**(3): p. 234-240.
21. Malan, L., Schutte, A.E., Malan, N.T., Wissing, M.P., Vorster, H.H., Steyn, H.S., Marthinus van Rooyen, J. & Huisman, H., *Specific coping strategies of Africans during urbanization: Comparing cardiovascular responses and perception of health data. Biological Psychology*, 2005. **72**: p. 305-310.
22. Wyatt, S., Akylbekova, E., Wofford, M., Coady, S., Walker, E., Andrew, M., Keahey, W., Taylor, H., & Jones, D. , *Prevalence, awareness, treatment, and control of hypertension in the Jackson Heart Study.* Hypertension, 2008. **51**: p. 650-656.
23. Hahn, W.K., J.A. Brooks, and D.M. Hartsough, *Self-disclosure and coping styles in men with cardiovascular reactivity.* Research in Nursing & Health, 1993. **16**(4): p. 275-282.
24. Stein, J.N., A., *Gender differences in relationships among stress, coping, and health risk behaviors in impoverished, minority populations. Personality and Individual Differences*, 1999. ***26***: p. 141-157.
25. McGee, Z.T., et al., *Urban stress and mental health among African-American youth: assessing the link between exposure to violence, problem behavior, and coping strategies.* Journal of Cultural Diversity, 2001. **8**(3): p. 94-104.
26. DeCoster, V.A. and S. Cummings, *Coping with type 2 diabetes: do race and gender matter?* Social Work in Health Care, 2004. **40**(2): p. 37-53.
27. Utsey, S.O., et al., *Examining the role of culture-specific coping as a predictor of resilient outcomes in African Americans from high-risk urban communities.* Journal of Black Psychology, 2007. **33**(1): p. 75-93.
28. Strickland, O., Giger, J., Nelson,M., & Davis, C., *The relationships among stress, coping, social support, and weight class in premenopausal African American women at risk for coronary heart disease Journal of Cardiovascular Nursing*, 2007. ***22***(*4*): p. 272-278.
29. Lewis-Coles, M.C., M., *Racism-related stress, africultural coping, and religious problem-solving among African Americans. Cultural Diversity and Ethnic Minority Psychology*, 2006. ***12***(*3*): p. 433-443.
30. Nyamathi A., S., J., & Swanson, J., *Personal, cognitive, behavioral, and demographic predictors of HIV testing and STDs in homeless women. Journal of Behavioral Medicine*, 2000. ***23***(*2*): p. 123-147.
31. Malan, L., et al., *Coping with urbanization: A cardiometabolic risk?: The THUSA study.* Biological Psychology, 2008. **79**(3): p. 323-328.
32. Dekker, J., Ormel J., *Depression and coping. European Journal of Psychiatry*, 1999. **13**: p. 183-89.
33. Lam, D., Scuck, N., Smith, N., Farmer, A., Checkley, S., *Response style, interpersonal difficulties and social functioning in major depressive disorder.* Affective Disorder, 2003. **75**: p. 279-283

34. Billings, A.M., R. , *Coping, stress and social resources among adults with unipolar depression. Journal of Personality and Social Psychology*, 1984. ***46***: p. *877-891*.
35. Lazarus, R., & Folkman, S., *Stress, appraisal and coping*. 1984(b), New York: Springer.
36. Payne, T., Wyatt, S., Mosley, T., Dubbert, P., Guiterrez-Mohammed, M., Calvin, R., Taylor, H., & Williams, D., *Sociocultural methods in the Jackson Heart Study: Conceptual and descriptive.* Ethnicity & Disease, 2005. **15**: p. 38-48.
37. Folkman, S.L., R., *Coping as a mediator of emotion. Journal of Personality and Social Psychology*, 1988. ***54***(*3*): p. 466-475.
38. Levine, J., Warrenburg, S., Kerns, R., & Schwartz, G., *The role of denial in recovery from coronary heart disease. Psychosomatic Medicine*, 1987. **49**: p. 109-117.
39. Lazarus, R., *Emotion and adaptation*. 2007, London: Oxford University Press.
40. Folkman, S.M., S., *Positive affect and the other side of coping. American Psychologist*, 2000. **55**: p. 647-654.
41. Operation, J.H.S.P.a.M.o., *Manual 2 Cohort Procedures.* 2001.
42. Chobabian, A., Bakris, G., Black, H., Cushman, W., Green, L., Izzo, J. Jr., Jones, D., Materson, B., Oparil, S., Wright, J. Jr., Roccella, E. , *The seventh report of the Joint National Committee on prevention, detection, evaluation, and treatment of high blood pressure. JAMA*, 2003. ***289***: p. 2560-2571.
43. Taylor, H., Wilson, J., Jones, D., Sarpong, D., Srinivasan, A., Garrison, R., Nelson, C., & Wyatt, S., *Towards resolution of cardiovascular health disparities in African Americans: Design and methods of the Jackson heart study* Ethnicity & Disease, (2005). **15**: p. 6-17.
44. Center, J.H.S.C., *Jackson Heart Study Analysis Manual Version 4.* 2007.
45. Lindgren, T., Fukuoka, Y., Rankin, S., Cooper, B., Carroll, D. & Munn, Y., *Cluster analysis of elderly cardiac patients' prehospital symptomatology Nursing Research*, 2008. **57**(1): p. 14-23.
46. Lindgren, T., Fukuoka, Y., Rankin, S., Cooper, B., Carroll, D. & Munn, Y., *Cluster analysis of elderly cardiac patients' prehospital symptomatology.* Nursing Researc, 2008. **57**(1): p. 14-23.
47. Hulley, B., Cummings, S., Browner, W., Grady, D., & Newman, T., *Designing clinical research*. Third ed. 2007, Philadelphia: Lippincott, Williams & Wilkins.
48. Bourjolly, J.H., K., *Similarities in coping strategies but differences in sources of support among African American and White women coping with breast cancer. Journal of Psychosocial Oncology*, 2001. ***19***(*2*): p. 17-38.
49. Utsey, S., Ponterotto, J., Reynolds, A. & Cancelli, A, *Racial discrimination, coping, life satisfaction, and self-esteem among African Americans. Journal of Counseling & Development*, 2000. **78**: p. 72-80.

PART II. AUTHOR CONTRIBUTIONS

11. Have all co-authors reviewed and approved this document? NA

12. Does the lead author (or designee) agree to present findings at a JHS Colloquium? or Seminar? Yes

Note: A lay summary is required when submitting the completed manuscript draft for JHS and NHLBI approvals.

PART III. ADDITIONAL INFORMATION

13. Is this manuscript proposal based on an Ancillary Study? _____ Yes **X** No
If yes, please provide the ASC # _____

14. Type of Study:

X Full Cohort ___ Family Study ___ Sub-Study
____ Ancillary Study ___ Case Control ___ Other (list):

15. Type of Data:

____ Longitudinal **X** Cross-Sectional ___ Other (list):

16. Location of Statistical Analysis:

___ Central (by Jackson Heart Study Staff)
X Local (The University of Tennessee Health Science Center)

17. Genetic Information:
    a. Do you propose use of data from a participant's DNA? ___ Yes (see b) **X** No
    b. If yes, for a primary aim or secondary aim of JHS? (Check one or both)

    ___ Primary Aim (heart, vascular disease) ___ Secondary Aim (other conditions)

18. Conflict of Interest
    a. Are these analyses to involve a for-profit corporation? _____Yes **X** No
    b. Do you or any member of your Writing Group intend to patent any process, or aspect of outcome from these analyses? _____Yes **X** No

19. Data Sharing Agreement
    Has the Lead Author and any co-authors who will have direct access to JHS data signed the JHS Data Sharing Agreement? **X** Yes (Required)

20. JHS Manuscript Overlap

The Lead Author has reviewed all existing JHS manuscripts / manuscript proposals and found:

a. No similar manuscripts / proposals **X** Yes
b. The following manuscripts / proposals with similarities: (List MS # title and Lead Author below):

- ***P#0039***—this paper, "Coping Strategies of the Jackson Heart Study Cohort and Self-Reported Cardiovascular Disease Health Status", was proposed by Dr. Clifton Addison and reports on the psychometric qualities of the CSF. P#1096 overlaps with P#0039 in the use of the CSF. The proposed study will expand on this work by examining the relationship among coping strategies and blood pressure and gender. Dr. Addison was contacted on Tuesday, April 7, 2009 and August 25, 2009.

- ***P#0075***—Entitled "Psychosocial Factors and Metabolic Syndrome in the Jackson Heart Study" was proposed by Dr. Marino Bruce and examines psychosocial factors and metabolic syndrome. P#1096 overlaps in that coping strategies are a psychosocial factor. P#1096 will expand on this work by determining relationships among coping strategies, blood pressure, and gender.

- ***P #0083—*** Dr. Thomas Payne will address spirituality and religion in proposed paper "Effects of Psychosocial Factors and Stressors on Biological and Behavioral Risk Factors for CVD in the Jackson Heart Study". P#0196 overlaps with P#0083 only minimally as P#0196 focuses on coping behaviors and blood pressure. I contacted Dr. Payne and discussed overlap on Monday, April 13, 2009. We also discussed the conceptual framework.

- ***P#0133—***Entitled "The Relationship of Discrimination Experiences, Chronic Illness and Mental Health among African Americans from the Jackson Heart Study: Do coping styles matter?" was proposed by Eunkyung Yoon. P#0133 addresses a broader array of variables, including discrimination factors than those proposed in #P0196. There is minimal overlap.

- ***P#0136***—Dr. Mario Sims proposed "Psychosocial Factors and Cardiovascular Disease among African Americans in the Jackson Heart Study". Dr. Sims examined psychosocial factors and CVD. P#0196 overlaps by discussing psychosocial factors and cardiovascular disease; however, P#0136 does not specifically examine coping strategies or blood pressure. Discussion was held with Dr. Sims on Tuesday, April 7, 2009.

Note: Completion of manuscript preparation is expected in less than two years. The manuscript proposal will expire if no manuscript draft is submitted for JHS review at the end of the three years from date of approval. If additional time is needed after three years, please contact JHS for extension.