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Family Adaptability and Cohesion and High Blood Pressure among Urban African American women

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Abstract

African American women are at greater risk for complications related to high blood pressure. This study examined relationships between high blood pressure, pulse pressure, body mass index, family adaptability, family cohesion and social support among 146 Urban African American women. Significant relationships were found between family adaptability and systolic blood pressure ($p = .03$) and between adaptability and pulse pressure ($p \leq .01$). Based on study results, practitioners should routinely assess family functioning, specifically family adaptability, in African American women who are at risk for high blood pressure or diagnosed with high blood pressure to minimize complications associated with hypertension.

Keywords

high blood pressure; family adaptability; African American women; pulse pressure; social support

African American women of all ages are at risk for developing high blood pressure with approximately 44% of African American women diagnosed with hypertension.¹ Hypertension is directly related to heart disease, the number one cause of death among African American women.

Studies have identified many physiologic correlates of high blood pressure, including Body Mass Index (BMI), sodium-intake, lack of regular physical exercise, and alcohol consumption.^{2, 3} Research findings have indicated that some significant psychosocial and socioeconomic correlates of high blood pressure for African Americans include: perceived racism, anger, anxiety, race, skin tone, and depression.^{4,5,6}

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Previous studies have shown that an additional psychosocial variable, low social support is positively associated to high blood pressure.^{7,8,9} Most studies that examined a specific structural form of social support, the family, and its relationship to high blood pressure have used the marital relationship as the primary form of familial social support.^{10,11,12} Studies using the marital relationship to define family have limited generalizability because estimates from the Census Bureau (2007),¹³ state that 53% of African American families were led by a female single parent compared to 20% Caucasian families being led by a female single parent. Therefore, the nonmarital form of familial support provided to African American women is a particularly relevant variable to examine.

In addition, in African American culture, a major source of strength is the family, which may be comprised of people who are related to each other by blood, marriage, formal adoption, informal adoption, or affiliation.¹⁴ Limited research has been published on the influence of the African American immediate family and the health of its members. One study that examined the African American family found familial support had a positive influence on health.¹⁵ Dressler's⁷ reported that perceived low kin (family or relative) support was related to increased systolic blood pressure among older Blacks from diverse cultural backgrounds. While knowing *who* provides support to an individual is important, understanding the relationship between high blood pressure and the perception of the family's ability to handle change (family adaptability) and perceived family togetherness (family cohesion) is just as important.

As few studies have examined effects of family adaptability and cohesion and their relationship to blood pressure readings, the purpose of this correlational study is to examine relationships between family adaptability, cohesion, BMI, pulse pressure and blood pressure among African American women. Despite findings from previous studies, few published empirical investigations have studied the relationship between family adaptability, cohesion and blood pressure among African Americans. Continued investigation of this relationship among African American women is important as they head many African American families and are at risk for high blood pressure and its complications.

Family cohesion and adaptability and high blood pressure

Family cohesion is a component of family support that describes the extent of emotional togetherness and bonding experienced within families.¹⁶ Family adaptability is a component of family support that describes the family leadership, role relationships and relationship rules as well as the ability of the family to reorganize in response to situational and developmental stress.¹⁷

Studies on family adaptability and cohesion have focused on health issues concerning chronic diseases, such as: breast cancer, diabetes, rheumatoid arthritis, or mental health, as well as social problems including racial identity and self-esteem.^{18, 19, 20} Results from previous studies indicated a positive relationship between family adaptability and cohesion and physiological health and mental health outcomes.^{18, 19, 20}

Social Support and blood pressure

Social support defined as the perceived level of assistance to which an individual has access, as well as the individual's perceptions of the adequacy of the assistance.²¹ The lack of social support has been shown to be a predictor of physical health issues, such as: mortality, cardiovascular disease, and complications in pregnancy.^{22, 23, 24} A comprehensive review of correlational studies that examined relationships between structural (e.g. social network) and/or functional (e.g. emotional) support on blood pressure found positive associations between increased levels of structural and/or functional support and lower blood pressure

readings.^{7,8,9} Of research that reported gender differences, differences in the type of social support appeared to influence blood pressure readings in men and women.^{8, 25} Based on findings by Bland et al.,²⁵ social network appeared to have a greater influence on blood pressure readings in men and instrumental (e.g. financial assistance) had a greater impact on blood pressure readings in women.

The relationship between social support and blood pressure readings among African Americans is not well understood. Of studies that included African American participants, low perceived support (instrumental/tangible support and appraisal support) was related to increased blood pressure.^{7,8,10} Dressler's⁷ assessed perceived familial and nonfamilial support and blood pressure in African Americans living in the southern United States and found that, low social (familial and nonfamilial) support was associated with increased systolic and diastolic blood pressure among participants.

Strogatz's⁸ examined the relationships between stress, social support, and high blood pressure among African Americans living in southeastern United States and found that high systolic blood pressure was associated with low social support and high stress. However, Strogatz's⁸ did not report on the relationship (family vs. friends) between women receiving and people giving emotional or instrumental support. These findings could have important implications for high blood pressure reduction interventions for African American women.

Body Mass Index (BMI), social support, and high blood pressure

In a study using data from the National Health and Nutrition Examination Survey, Janseen's² found that increased BMI was related to high blood pressure and other diseases, such as kidney disease, type 2 diabetes, etc. Mokdad's³ found that obesity (having a BMI of 30 or higher) was related to a higher incidence of high blood pressure. They also reported that African Americans had the highest rates of obesity (31.1%). These studies did not examine effects of social support on BMI and high blood pressure.

In a multilevel analysis of race, social support, demographics, and BMI, Robert and Reither's²⁶ found a strong association between race and BMI, with African American women generally having higher BMIs than White women. The authors also reported that increased BMI was related to lower socioeconomic status. However, no statistically significant relationship was found between social support and BMI. A possible explanation of this result could be the measure that was used to examine the social support variable. The present study may provide additional support that a relationship exists among BMI, social support, and high blood pressure.

Pulse pressure and high blood pressure

Recent studies have shown that pulse pressure and not blood pressure may be a better predictor of increased cardiovascular risk.^{27, 28} Haider's²⁸ found that pulse and systolic pressure were better predictors of congestive heart failure than blood pressure. In a meta-analysis, Balcher's²⁷ found that pulse pressure was a consistent predictor of cardiovascular risk in hypertensive patients. However, these studies did not focus on the relationship between pulse pressure, high blood pressure, and social support.

Thus, the purpose of the present study is an examination of the relationship between family adaptability, family cohesion, social support, body mass index (BMI), pulse pressure, and blood pressure among African American women. This study addresses the following research questions:

1. Can high blood pressure be predicted from perceived family adaptability, family cohesion, and social support, and personal demographics?

2. Is there a relationship between family adaptability and cohesion, social support, BMI, pulse pressure, and blood pressure readings among African American women?

Research Design and Methods

This correlational study used a secondary data analysis to examine the relationship between family adaptability, family cohesion, social support, and demographic factors on blood pressure readings and pulse pressure among African American women. The sample used for the present study was a subset of a larger hypertension genetic research study (n=183) that investigated gene environment interactions of hypertension among three generations of African American women.

Participants

For this study, a total of 146 normotensive (n = 69) and hypertensive (n = 77) adult women, living in a large metropolitan area in the Midwest, were included in the study. Criteria for inclusion in this study included: participants must be African American and female. Women with controlled blood pressure readings due to taking antihypertensive medications (n = 55, 37.7%) also were included in this study. In addition, for this study, participants could not be less than 18 years of age, have any co-morbidities such as substance abuse, mental illness, end-stage cancer, end-stage renal disease or other terminal illness. Study participants were compensated with \$20.00 gift certificates for two hours of their time spent in data collection.

Instruments

Demographic questionnaire

An original demographic survey was used to obtain information from participants on personal characteristics, including age, educational attainment, household income, marital status, and employment.

Blood pressure

Three systolic and diastolic blood pressure readings, using a digital blood pressure monitor with upper arm cuff, were obtained during the one-time interview. The three blood pressure readings were taken at least 5-minutes apart; participants were wearing unrestrictive clothing, with their feet on the floor, backs supported, and their arms supported at heart level. The average of three blood pressure readings was used in the statistical analysis of this study. Cut-points for repeated blood pressure readings were classified as: normotensive (120/80 and below), prehypertensive (120/80 to 139/89), stage 1 hypertensive (140/90 to 159/99), and stage 2 hypertensive (160/100 or higher).¹ For the purpose of this study, a median split at systolic blood pressure readings of 130 was used. Average systolic blood pressure at or below 130 was considered normotensive, with average systolic blood pressure above 130 included in the hypertensive group.

Pulse pressure

For the present study and in other research literature, a participant's pulse pressure is calculated by subtracting average diastolic blood pressure from the average systolic blood pressure.²⁷ Resting pulse pressure in healthy adults, in a sitting position is 40 mmHg. The most important cause of increased pulse pressure is atherosclerosis, which reduces the elasticity and increases the stiffness of the aorta.²⁷ For the purpose of the present study, abnormal pulse pressure is a pulse pressure greater than 40 mmHg.

Body mass index (BMI)

Body mass index (BMI) is the relationship between weight and height that is associated with increased risk for a variety of health complications. BMI over 25 is considered overweight and a BMI equal to or greater than 30 is considered obese. Weight was measured using an electronic scale (BWB/807 Tanita Tokyo, Japan). Height was measured using a portable stadiometer (Model 214 Road Rod, Seca Corporation, Hanover, MD).

Family adaptability and cohesion

For this study, the Family Adaptability and Cohesion Evaluation Survey (FACES III), a self-report instrument designed to measure two concepts of perceived family functioning: adaptability and cohesiveness, was used.¹⁷ The measure has 20-items, with 10 items measuring family adaptability and 10-items measuring family cohesion. Participants responded to the items using a 5-point Likert-type scale ranging from (1) almost never to (5) almost always. Possible scores for family cohesion and adaptability could range from 10 to 50. Cut points for the cohesion scale were used to form two groups: low (separated) (10–40) and high (connected) (41–50).¹⁶ Similarly, the cut points for the adaptability scale were used to form two groups: low (structured) (10–24) and high (flexible) (25–50).²⁹ Olson's²⁹ reported Cronbach's alphas of 0.76 and 0.75 for the family cohesion scale and 0.58 and 0.63 for the family adaptability scale. For participants in the present study, Cronbach's alphas were 0.89 for family cohesion and 0.76 for adaptability.

Social support

The Multidimensional Scale of Perceived Social Support (MSPSS), used in this study, is a self-report instrument designed to assess the adequacy of three sources of social support; family, friends, and significant other.²¹ The MSPSS is a 12-item measure that is rated using a 7-point rating scale, ranging from (1) very strongly disagree to (7) very strongly agree. Possible scores for the MPSS could range from 12 (least adequate) to 84 (most adequate) and then separated into three subgroups. Cut points for these three subgroups were: low (12–60), medium (61–74), and high (75 or greater).²¹ Zimet's²¹ reported Cronbach's alphas of .91, .87, and .85 for the significant other, family, and friends subscales, respectively. For the entire scale a Cronbach's alpha of .88 was reported. For participants in the present study on this scale, a Cronbach's alpha of 0.89 was obtained.

Data Analysis

Descriptive statistics were obtained for all variables using either frequency distributions or measures of central tendency and dispersion, depending on the scaling of the variables to provide a profile of the participants. Pearson product moment correlations were used to test the strength and direction of relationships between demographic variables, family cohesion, family adaptability, social support, blood pressure, and pulse pressure. Multiple regression analyses were used to examine the effects of family adaptability and cohesion, social support on blood pressure readings and pulse pressure. All decisions on the statistical significance of the findings were based on a criterion alpha level of .05.

Results

Sample characteristics

Participants ranged in age from 18 to 63 years, with a mean of 48.9 ($SD = 17.9$) years. Thirty-two percent of the participants had some college education and 33.3% held either undergraduate or graduate degrees. Most participants (41.8%) reported their annual household income was over \$40,000 and 25% were working 40 hours per week. Over 50% of the participants were unmarried. Most participants (91%) had some form of health

insurance. Other than hypertension, 92% of the study participants reported that they had no other health concerns (e.g. thyroid, diabetes, etc.) and 91% did not smoke cigarettes.

Forty-five percent of the participants had been previously diagnosed with hypertension. The mean systolic blood pressure was 136.49 ($SD=21.01$) mm-Hg, and 82.60 ($SD=11.77$) mm-Hg for diastolic blood pressure. Mean pulse pressure was 53.88 ($SD=17.84$) and mean BMI was 32.44 ($SD=8.06$). The mean systolic blood pressure of the study participants was in the prehypertensive range. The mean pulse pressure of the study participants was abnormal. The mean BMI for study participants was in the obese range ($M=32.44$, $SD=8.06$). The mean family adaptability score was 22.48 ($SD=5.42$), with this score indicating that most participants perceived their family as less flexible or “structured.” The mean family cohesion score was 36.31 ($SD=7.33$), indicating that most participants perceived their family as less cohesive or “separated.”

Family Adaptability, High Blood Pressure and Pulse Pressure

The relationship between family adaptability and systolic blood pressure was significant ($r=.18$, $p<.05$), while the relationship between family adaptability and diastolic blood pressure was not statistically significant. The relationship between family adaptability and pulse pressure was statistically significant ($r=.29$, $p<.01$; Table 1).

Family Cohesion, High Blood Pressure and Pulse Pressure

The relationship between family cohesion and systolic and diastolic blood pressure was not significant. In addition, the relationship between family cohesion and pulse pressure was not statistically significant (See Table 1).

Social Support, High Blood Pressure and Pulse Pressure

Nonsignificant correlations were obtained between social support overall and systolic blood pressure, diastolic blood pressure and pulse pressure. The support of family, friends and a significant other was not statistically significantly related to systolic, diastolic blood pressure or pulse pressure.

Family Adaptability and Cohesion, Social Support, Blood Pressure and Pulse Pressure

The findings from the multiple regression analysis of family adaptability, family cohesion, social support, blood pressure and pulse pressure indicate that family adaptability was a statistically significant predictor of pulse pressure ($p=.00$) in a positive direction. The multiple regression analysis findings also indicated that adaptability is not a statistically significant predictor of either systolic or diastolic blood pressure or social support.

Discussion

Findings from this study expand the limited research on the relationships among high blood pressure and family functioning, social support, BMI, and pulse pressure among African American women. In this study, the relationship between family adaptability and systolic blood pressure was statistically significant ($p<.05$). Study participants reported that their families were less flexible as determined by their family adaptability score and had a mean systolic pressure of 136, which is above the recommend range for systolic blood pressure. Additionally, the relationship between family adaptability and pulse pressure was also statistically significant ($p<.01$). The mean pulse pressure of study participants was 54 mmHg and abnormal pulse pressure for the present study was defined as pulse pressure greater than 50 mmHg. As indicated by this finding, African American women who report that their family is less flexible also experience higher than average pulse pressure putting them at risk for complications of elevated pulse pressure such as increased artery damage. These findings

provide physiologic support to findings reported by Lavee and Olson.³⁰ Lavee and Olson's³⁰ reported that families that perceived themselves as less connected and less flexible tend to perceive transitional changes as more problematic and less manageable than do families who are more connected or more flexible.

In our study, adaptability was a statistically significant predictor of both systolic blood pressure and pulse pressure. Adaptability is the family's ability to reorganize in response to situational and developmental stress.¹⁶ These relationships were in a positive direction, with higher systolic blood pressure readings and high pulse pressures associated with perceptions of less flexibility in the family. In other words, African American women who perceive their family as having difficulty reorganizing in response to stress (lack of adaptability) or less flexibility are more likely to perceive increased stress. Furthermore, the perceived lack of adaptability and subsequent perceived increased stress may then be internalized, lead to increased systolic blood pressure and pulse pressure and the development of serious health complications. Our findings support results of previous research that found that African American families may be more vulnerable to serious health complications related to the stress of caregiving.^{31, 32, 33} Specifically, Samuel-Hodge's³¹ found that general life stress and multi-caregiving responsibilities interfered with daily diabetes management among African American women. A family that is more adaptable to stress and family transitions may provide a buffer to the potential complications of high blood pressure among African American women.

However, results of this study did not indicate a statistically significant relationship between diastolic blood pressure and family adaptability, family cohesion and social support. These findings indicate that diastolic blood pressure, the resting pressure when the heart is in its relaxation phase, may not be a good indicator of family adaptability, family cohesion and social support. The relationships between BMI and family adaptability, cohesion and social support were not statistically significant. These findings indicate that BMI may not be a good indicator of family adaptability, cohesion and social support. The relationships between pulse pressure and family cohesion and social support were not statistically significant. These findings indicate that pulse pressure may not be a good indicator of family cohesion and social support.

Limitations

This study has important limitations that should be noted. First, data collected for this study was part of a larger study examining genetic polymorphisms for high blood pressure among three generations of African American women. The researcher lacked control over the data collection process. The study was limited to 146 African American women who at the time of the study were grandmothers or mothers. These women were involved in family functioning and had social support from significant others and their children. Results cannot be generalizable to other studies of women who do not have the same family composition or were from other ethnic groups. Second, this study of high blood pressure among African American women was limited to African American women living in a large urban area in the Midwest. African American women living in suburban and rural areas may have different experiences and outcomes than those who live in an urban area. Region and type of setting have important influences. Third, the use of subjective measures (e.g., family functioning and social support) may have been areas of self-report bias and that could affect the outcomes of the study. Study participants may have given responses that could be considered socially acceptable, instead of providing accurate responses to the questions. Last, the age of the participants is a limitation of the study. Research has shown that increasing age is associated with increased blood pressure readings. In addition, the average age at onset of high blood pressure is between 30 and 50 years of age for African American women and the average age of the study participant in the present study was 49 years of age.

Those factors may already put the study participants at increased risk for high blood pressure. More research on the relationship between family functioning, social support, BMI, pulse pressure and high blood pressure among African Americans is needed before conclusions could be drawn concerning family functioning, support from family, friends and significant others and high blood pressure.

Implications for Practice with Families

This study has implications for nurse practitioners charged with the care of African American women at risk for or diagnosed with high blood pressure. Patients diagnosed with high blood pressure are routinely prescribed antihypertensive medication, diet and exercise to manage a patient's high blood pressure and reduce risks associated with high blood pressure. Nurse practitioners assess the patient's knowledge and understanding related to a diagnosis of high blood pressure, barriers to health care and medication to mitigate circumstances associated with uncontrolled high blood pressure and risks to high blood pressure related complications. However, results from our study indicate that nurse practitioners should routinely complete a family assessment of their African American female patients. It can no longer be assumed that large, extended and cohesive networks still exist in African American families. 32 Family assessments should include questions about how a woman is coping with the stresses of her personal relationships (e.g. family, friends, significant others). As indicated by this study, stresses of personal relationships may contribute to increased blood pressure. Routine family assessments are essential as to not overlook any adverse changes to the patient's social and family networks as well as adaptation to any changes. If family and social network changes and adaptation to the changes are assessed as negative, then nurse practitioners can make appropriate referrals (e.g. spending free time with positive friends, support groups, social worker, minister/pastor, psychologist, etc.) for support and follow-up, as recommended by the National High Blood Pressure Education Program.³⁴ These types of assessments could lead to improved insight as to the factors that contribute to uncontrolled high blood pressure (e.g., multi-caregiver role stress, perceived social support, perceived less cohesion and less flexibility). Furthermore, the family assessment may lead to the development of preventative measures for those patients who are at risk for high blood pressure. Referral to supportive services may help to decrease the patient's blood pressure thus reducing the need for additional high blood pressure medication and the risk for health complications related to high blood pressure. When managing the care of African American women with high blood pressure, nurse practitioners should assess and acknowledge to the patient the significant role that family cohesion and adaptability as in the women's ability to successfully manage her high blood pressure.

Conclusion

This study provided an understanding of the relationship between high blood pressure, pulse pressure, body mass index, family adaptability, family cohesion and social support among African American women. The results indicate the need for future research on African American women and high blood pressure including, measures of family functioning with variables specific to the African American population. These measures need to be tested for validity and reliability to assure their relevance for this population. Further research is needed to understand the relationship between family cohesion, social support and high blood pressure among a larger heterogeneous sample. Additional research is needed that examines additional variables be evaluated for their relationship on high blood pressure, perceive family functioning and perceived social support that could impact the control or reduce the risk of high blood pressure, such as health literacy and health promoting behaviors, among African American women.

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Table 1

Correlations between variables (N = 146)

Measure	1	2	3	4	5	6	7	8	9	10
1. Systolic BP	—									
2. Diastolic BP	.53**	—								
3. Body Mass Index (BMI)	.09	.07	—							
4. Pulse Pressure	.83**	-.04	.06	—						
5. Family Cohesion	.03	-.01	.00	.04	—					
6. Family Adaptability	.18*	-.12	.03	.29**	.37**	—				
7. Social Support-Family	.00	-.03	-.09	.02	.60*	.20*	—			
8. Social support-Friends	.00	-.03	-.09	.02	.60**	.20*	1.00**	—		
9. Social support-Significant Others	-.16	-.08	-.05	-.14	.19*	.16	.30**	.30**	—	
10. Social support – Overall	-.01	-.10	-.06	-.05	.49**	.24**	.77**	.77**	.75**	—

Note.

* $p < .05$,

** $p < .01$

Table 2
Multiple Linear Regression Analysis-Family Functioning and Social Support (Mean Systolic Blood Pressure)

Variable	B	SE B	β	t-Value	Sig. of t
Family Cohesion	.06	.29	.02	.22	.83
Family Adaptability	.82	.36	.21	2.30	.02*
Social Support Overall	-2.50	1.62	-.15	-1.52	.13
R^2	.05				
F	2.43				

Table 3
Multiple Regression Analysis-Family Functioning and Social Support (Mean Diastolic Blood Pressure)

Predictor Variables	B	SE B	β	t-Value	Sig. of t
Family Cohesion	.16	.16	.10	.99	.326
Family Adaptability	-.27	.20	-.12	-1.36	.175
Social Support Overall	-1.15	.92	-.12	-1.26	.211
R^2	.03				
F	1.23				

Table 4
Stepwise Multiple Regression Analysis-Family functioning and social support (Mean Pulse Pressure)

Predictor Variables	B	SE B	β	t-Value	Sig. of t
<u>Included Variable</u>					
Family Adaptability	.97	.27	.29	3.6	.000
<u>Excluded Variables</u>					
Family Cohesion			-.08	-.88	.38
Social Support Overall			-.12	-1.51	.132
R^2	.082				
F	12.91				

Note: B is unstandardized beta and β is standardized beta.