



Relationship between Psychosocial-cultural Factors and African American Women Obesity.

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**Analysis:** Measures for socioecological model (SEM) were analyzed using a regression model in SPSS.

**Results:** Intrapersonal and community/institutional levels were found to be significantly associated with BMI. Two multiple regression analyses models were developed to determine predictive capabilities. Model 1 was found to be more predictive than model 2, but both had a low level of predictive capability for BMI.

**Conclusion and Implications:** Findings in this study indicate that intrapersonal and community influences have the greatest impacts on obesity rates among African American women.

Providing African American women with the resources needed to improve their financial circumstances, through higher educational attainment women can impact a number of community/institutional variables, impacting weight.

#### Keywords:

African American; women; obesity; BMI; socioecological models; determinants of health; health

inequities

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## **Relationship between Psychosocial-cultural Factors and African American Women Obesity**

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### **INTRODUCTION**

National data indicates that an overwhelming 77% of African American women over the age of 20 are overweight or obese (Wang, 2007). National Health Interview Survey (NHIS) data reflects the same disproportionately high rates of overweight and/or obesity, with African

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American women representing the most obese population in the U.S. today Centers for Disease Control and Prevention [CDC], 2009). According the National Health Statistics, African Americans had higher rates of hypertension, diabetes, and obesity U.S Department of Agriculture [USDA], 2010). In addition to having a greater risk for chronic disease African Americans experience more complications and endure greater rates of mortality (USDA, 2010). Data has shown deterioration among African Americans in certain disease categories and an increase in the standardized mortality ratios (SMRs) (Satcher, Fryer, McCann, Troutman, Woolf, & Rust, 2000).

Research suggests that African American women are acutely aware of the contributing factors of obesity and the potential risk factors of being obese (Winston, et al, 2014). Wintson et al. (2014), reported a high percentage of their study participants to be knowledgeable about risk factors and consequences of obesity, but the knowledge was not associated with positive behavior change. Despite this awareness and data indicating the benefits of adapting a healthy lifestyle the goal of preventing and managing obesity for African American women remains elusive.

Obesity is a complicated disease process with multiple contributing factors (Breland, Fox, and Horowitz, 2012). Poor diet and physical inactivity are two factors that have been widely accepted as contributing to obesity (U.S. Department of Health and Human Services, 2015). Research has shown a significant difference between the African American and European American women's physical activity levels, with African American women reporting less time engaged in leisure activities (Abraham, Kazman, Zeno, and Deuster, 2013). Additionally, African American women report lower intakes of fruits, vegetables, and whole grains in comparison to their European American counterparts (Abraham, Kazman, Zeno, and Deuster, 2013).

Dietary and physical activity behaviors that affect obesity are influenced by a number of sociocultural and psychosocial factors (Sallis and Glanz, 2006). Social cues from significant others, family members, and friends within the African American community dictates a larger than average body aesthetic (Agyemang and Powell-Wiley, 2013). Additionally, for many African American women the configuration of their social and physical space negatively impacts their ability to engage in physical activity and access healthy food options (Fitzgerald & Spaccarotella, 2009; Sallis & Glanz, 2006). Determinants of dietary intake and physical activity can be identified through the social ecological model (SEM) and the use of this model can be efficacious in the development of interventions with a multi-pronged approach focusing on the drivers of behavior (Bravemen, Egeter, and Williams, 2011; Institute of Medicine [IOM], 2002; Smedley, Stith, & Nelson, 2003).

The SEM has been used to understand health behaviors in a number chronic diseases through focusing on how behaviors are informed through internal traits and contact with the external environment. Additionally, the SEM posits that health is influenced by multiple interacting spheres (Fitzgerald & Spaccarotella, 2009). The model is represented by the following concentric spheres; intrapersonal, interpersonal, community/institutional, and public policy. The intrapersonal sphere examines biological and sociocultural characteristics of the individual including factors such as age, race/ethnicity, socioeconomic status, sex, beliefs, values, and preferences (Fitzgerald & Spaccarotella, 2009). The interpersonal sphere, explores the close social and cultural relationships and interactions which can shape individual behavior (Fitzgerald & Spaccarotella, 2009). The community sphere focuses on the environment and the role land use, urban design, and safety in health habit acquisition (Fitzgerald & Spaccarotella, 2009). Finally, the public policy sphere examines the role of values, norms, and policies.

The SEM provides a broad framework by which to explore BMI status in African Americans. Health outcomes such as weight status is explained largely by these Social Determinants of Health (SDOH) within the SEM. The SDOH are defined as conditions that influence the health landscape of an individual. The SDOH are linked together through a multitude of complex interactions that impact obesity (Bravemen et al., 2011; IOM, 2002). At the individual level, economics can impact living conditions and access to care, influencing health (IOM, 2002). Based on the SDOH and SEM interventions researchers and healthcare providers must move towards creating a comprehensive approach factoring the numerous determinants that inform the health landscape of African American communities (Bravemen et al., 2011; IOM, 2002; Smedley, Stith, & Nelson, 2003).

Figure 1.  
The Socio-Ecological Model (SEM) related to NSAL study concepts and measures.

Spheres of Influence	Description	Concepts	Measures
<b>Intrapersonal</b>	Individual characteristics that influence behavior, such as knowledge, attitudes, <b>beliefs</b> , preference, <b>health status</b> , <b>age</b> , and <b>socioeconomic limitations</b> , self-concept, skill, developmental history, and personality traits.	Demographics Socioeconomic Status (SES) Health Habits Health Status Psychosocial	Age Marital Status Income Education Employment Status Gardening Sports/Exercise Walking Physical Health Rating Mental Health Rating Life Satisfaction General Anxiety Depression
<b>Interpersonal</b>	Primary relationships and social interactions that can impact behavior through <b>cultural, social support</b> , a base for social identity & racial identity development, and role definition.	Social Support Culture	Church Membership Race problems Upset by race problems
<b>Community/Institutional</b>	Organizational relationships and community characteristics such as neighborhood design, worksite health, and school wellness initiatives influence	Access & Land use Neighborhood Safety	Supermarkets Parks Medical Centers Health Insurance Police Presence Crime Drugs

	<p>behavior through their built environment. Particular focus is on <b>neighborhood safety, urban sprawl, land use, food access, and ability to seek medical assistance.</b></p>	
<p><b>Public Policy</b></p>	<p>Local, state, federal policies and laws that regulate or support healthy behaviors for disease prevention, control, and management.</p>	<p>**No measures were included in the NSAL that directly examined public policy.</p>

(Adapted from Fitzgerald, N., & Spaccarotella, K., 2009)

### Purpose

The purpose of this study was to investigate the relationships between the social determinants of health and BMI among African American women. The current study will examine how certain SDOH variables are associated with BMI of African American women. Specifically, the SEM was used to investigate African American women’s BMI in a holistic manner (IOM, 2002). The structure of this paper will follow the SEM, presenting the spheres of influence systematically as to provide an integrative view of obesity among African American women. Figure 1 illustrates the SEM and its defined spheres of influence with mapped study measures, respectively.

### Rationale

Inactivity and unhealthy eating contribute to obesity, cardiovascular disease, diabetes, and cancer (Durstin, Gordona, Wang, Luo, 2013; Guillermo, Boushey, Franke, Monroe, Lim, Wilkens, Marchand, and Maskarinec, 2020). The prevalence of chronic disease for African Americans is substantially higher than their European American counterparts, and despite efforts to reduce disparities significant differences between the racial/ethnic groups still exist. Researchers tend to focus on issues of access (Smedley, Stith, & Nelson, 2003). While addressing issues of access to appropriate care is an important component in reducing obesity rates of African Americans, even after controlling for these factors, obesity rates still remain disproportionately high (Labonté & Schrecker, 2007; Saha, Komaromy, Koepsell, & Bindman, 2007).

## **METHODS**

A secondary data analysis was performed using National Survey of American Life Self-Administered Questionnaire, 2001-2003 (NSAL-SAQ). The NSAL-SAQ is a national household probability sample, consisting of a 368-page questionnaire containing 1029 questions (Jackson, Cleopatra, David, Harold, Randolph, Robert, and Steven, 2003). Data for the NSAL-SAQ was collected between February 2001 and June 2003. The NSAL-SAQ is a unique dataset, which offers a comprehensive assessment of the lived experiences of African Americans. To date no other such dataset exists, which provides the means to study the racial disparity of obesity through exploration of a multitude of variables. As obesity rates continue to rise and proposed interventions fall short

of reducing the obesity rates in African American communities, it is important to engage in exploratory studies to find associations which might be fruitful in addressing this problem.

#### Purpose

The purpose of the NSAL-SAQ was to assess the quality of Black life in America through the examination of physical, emotional, cultural, and social circumstances. The NSAL-SAQ was sent out via mail as a follow up to the National Survey of American Life, 2001-2003 (NSAL) in order to collect additional data from respondents regarding, psychological, group and personal identity (racial awareness and identity), as well as ideology and racial relations, political attitudes, job and financial stressors, and wealth (Jackson, Cleopatra, David, Harold, Randolph, Robert, and Steven, 2003).

#### Participants

Participants for the NSAL-SAQ were recruited from the initial NSAL study. Participants for the NSAL were provided an opportunity to complete the NSAL-SAQ. Participants who indicated they would like to participate were mailed the NSAL-SAQ. The response rate for the NSAL-SAQ was 56.5%, representing African Americans, Caribbean Blacks, and Caucasians. For the purposes of this paper, only African American females at a BMI of 18.5 kg/m<sup>2</sup> or greater were included in the final sample (n = 2,100).

#### Measures

*Dependent variable.* Body Mass Index (BMI) was selected as the dependent variable. BMI, defined as weight in kilograms divided by the square of height in meters, was calculated from self-reported heights and weights, and categorized into five categories; normal (BMI 18.5-24.9 = 2), overweight (BMI 25.0-29.9 = 3), obesity I (BMI 30.0-34.9 = 4), obesity II (BMI 35.0-39.9 = 5), and obesity III (BMI ≥ 40.0).

*Predictor variables.* Predictor variables were categorized based on the SEM. Measurements within the dataset were selected for their approximation to the description of each SEM sphere. The public policy sphere was not measured in this study, as this specific construct was not directly measured and did not have good proxies in the NSAL-SAQ.

#### Intrapersonal

Demographic data and health status data were used for the intrapersonal constructs. Intrapersonal sphere relates to individual characteristics such as race, SES, marital status, and health status. The following continuous variables were recoded into an ordinal level of measurement; “*What is your age?*” recoded as “Age 18-24”, “Age 25-44”, “Age 45-64”, and “Age greater than 64”, “*What is your household income?*” recoded as “Less than 25,000”, “\$25,000-\$39,999”, “\$40,000-\$49,999”, “\$50,000-\$59,999”, “\$60,000-\$69,999”, “\$70,000 or greater”. The following questions were recoded into dichotomous variables to represent the intrapersonal sphere concepts related to demographics; “*What is your highest grade completed?*” recoded as “Less than high school” (yes = 1, no = 0), “High school graduate” (yes = 1, no = 0), “Some college” (yes = 1, no = 0), and “College or higher” (yes = 1, no = 0), “*What is your employment status?*” recoded as *Employed, Unemployed, and Not In Labor Force*, and “*What is your marital status?*” recoded as *Married/Cohabiting* (yes = 1, no = 0), “*Divorced/Separated/Widowed*” (yes = 1, no = 0), and “*Never married*” (yes = 1, no = 0).

Health habits and health status were derived from the following questions; “How often do you garden/yardwork?”, “How often do you engage in sports/exercise?”, “How often do you take walks?” Responses were based on a 4-point Likert scale (often = 1, sometimes = 2, rarely = 3, never = 4). Participants were asked to rate their physical and mental health. Responses were based

on a 5-point Likert scale (excellent = 1, very good = 2, good = 3, fair = 4, poor = 5). Mental health status was further assessed through asking the following questions; “What is your satisfaction with life as a whole?” (very satisfied = 1, somewhat satisfied = 2, somewhat dissatisfied = 3, very dissatisfied = 4), “Have you been diagnosed with any of the following, check all that apply; “DSM-IV Major Depressive Episode (Lifetime)”, “DSM-IV Generalized Anxiety Disorder (Lifetime)”, “DSM-IV Major Depressive Episode (12Mo)”, and “DSM-IV Generalized Anxiety Disorder (12Mo)”. Responses were coded as dichotomous variables (not endorsed = 0, endorsed = 1).

#### Interpersonal

Social support questions and questions relating to race and ethnicity were used as measures for the interpersonal construct. This sphere focuses on relationships and social interactions that can impact behavior. The following question was used as a proxy for social support and cultural; “Are you an official member of a church?”. Responses were dichotomous (no = 0, yes = 1). The further assess social interactions within society related to the construct of races the following questions were asked; “In the past month did you/your family have race problems (i.e. discrimination, prejudice)?”, which was a dichotomous variable and “The amount race problems upset you?” (a great deal = 1, only a little = 2, not at all = 3).

#### Community/Institutional

Questions addressing community crime, recreational space, and access to services were used as proxies for the community/institutional sphere of the SEM. The construct of community/institutional sphere was derived through asking the questions focuses on assessing access and land use. The following dichotomous questions were included in the analyses; “Are there park/playgrounds/open space in neighborhood?”, “Is there a supermarket in neighborhood?”, “Is there a medical clinic in neighborhood?”, “Are you covered by employer health insurance?”, “Are you currently covered by government health insurance programs?”, “Are you covered by family's employer health insurance?” “Have you purchased health insurance directly?” Responses were recorded as yes and no (yes = 1, no = 0). Three additional questions relating to safety were included to assess access and land use, as neighborhood crime can be a deterrent to engaging in outdoor leisure activities. The following questions were included for analyses; “Is there a police station in neighborhood?” Responses were yes and no. The remaining questions were based on a 5-point and 4-point Likert scale respectively. “What is the frequency of crime in your neighborhood?” (very often = 1, fairly often = 2, not too often = 3, hardly ever = 4, never = 5) “What is the seriousness of drug problems in your neighborhood?” (very serious = 1, fairly serious = 2, not too serious = 3, not serious at all = 4).

#### Statistical analysis

*Descriptive data.* Data was analyzed using IBM SPSS Statistics software for Windows version 20.0 (2011, Chicago, IL). Descriptive statistics were performed for demographic and behavioral characteristics of all African American females in the NSAL-SAQ dataset.

*Linear regression.* Variables used for simple linear regression were determined based on SEM spheres of influence (intrapersonal, interpersonal, and community/institutional). Simple linear regression analyses were used to determine statistically significant variables. Variables not reaching significance ( $p < .05$ ) were excluded from model 1.

*Multivariable models.* Multiple linear regression analysis was used to examine the effects of SEM measures on BMI. Two models were developed from several measures that related to the SEM spheres of influence. The first model was established from statistically significant variables in the linear regression analyses. SEM measures with  $p < .05$  were included in model 1. Model 2



included all the model 1 variables in addition to two SEM measures of the interpersonal sphere, which included social support (church membership) and culture (race problems). Additionally, measures for life satisfaction, depression, gardening, and access to health insurance were included in model 2. Adjusted  $R^2$  ( $R^2_{adj}$ ) was used to calculate the proportion of variation between the two models. The most predictive model was determined by comparing standardized coefficients ( $\beta$ ) and  $R^2_{adj}$  values.

## RESULTS

Table 1 presents demographics for this study. All participants were African American females ( $N = 2100$ ). Participants were between the age of 18-94 years and had an average age of 42.72 years ( $SD = 16.19$ ). The majority of participants were not married/cohabitating with 67.5% reporting being divorced/separated/widowed or never married. Approximately 74% of the sample had at least a high school education. Household income ranged from \$0 to \$200,000, with an average of \$27,929. Approximately 57% of the sample had a household income of \$25,000 or less, with an additional 18% reporting earning \$25,000 to \$39,999. Participants reported work status with 63% indicating being employed. Participants BMI ranged from 18.50 to 57.93, with mean BMI of 29.66 ( $SD = 6.74$ ) for the total sample. Normal weight respondents mean age and BMI were 40.27 ( $SD = 16.83$ ) and 22.48 ( $SD = 1.70$ ) respectively. Overweight/obese respondents mean age and BMI were 43.69 ( $SD = 15.83$ ) and 32.4773 ( $SD = 5.821$ ), difference between normal weight and overweight/obese respondents were statistically significant for both age and BMI.

Table 1.  
Demographic Characteristics, 2001–2003 National Survey of American Life,  
African American Females (N = 2100).

	<u>Total Sample</u> N (%)	<u>Normal Weight</u> N (%)	<u>Overweight/Obese</u> N (%)
Total	2100(100%)	592(28.2%)	1508(71.8%)
Education			
Less than high school	560(26.29%)	137(23.1%)	415(27.5%)
High school graduate	793(37.23%)	203(34.3%)	582(38.6%)
Some college	490(23.0%)	144(24.3%)	340(22.5%)
College or higher	287(13.47%)	108(18.2%)	171(11.3%)
Income			
Less than \$25,000	1203(57.3%)	334(56.4%)	869(57.6%)
\$25,000-\$39,999	383(18.2%)	102(17.2%)	281(18.6%)
\$40,000-\$49,999	188(9.0%)	49(8.3%)	139(9.2%)
\$50,000-\$59,999	104(5.0%)	29(4.9%)	75(5.0%)
\$60,000-\$69,999	68(3.2%)	22(3.7%)	46(3.1%)
\$70,000 or greater	154(7.3%)	56(9.5%)	98(6.5%)
Marital Status			
Married/Cohabiting	625(29.34%)	165(27.9%)	455(30.2%)
Divorced/Separated/Widowed	776(36.43%)	186(31.4%)	583(38.7%)
Never married	729(34.23%)	241(40.7%)	470(31.2%)
Work Status			
Employed	1343(63.05%)	364(61.5%)	960(63.7%)
Unemployed	249(11.69%)	94(15.9%)	152(10.1%)
Not In Labor Force	538(25.26%)	134(22.6%)	396(26.3%)
Age (Mean, Std. Dev.)	42.72(16.188)	40.27(16.83)	43.69(15.83)
BMI (Mean, Std. Dev.)	29.66(6.74)	22.48(1.70)	32.48(5.82)

### Multivariable Models

Three regression models were applied for BMI. In the multiple regression analyses all model results are presented in Table 3. Model 1 (Adj. R2 = .072) revealed that the SEM without the inclusion of the interpersonal sphere of influence, which excluded the measures race problems, upset by race problems, and church membership was better in its ability to predict BMI than model 2 (Adj. R2 = .057). Model 3 included all the study variables and was the least predictive (Adj R2 = .026). Model 1 shows completion of less than high school ( $p = .000$ ), completion of high school ( $p = .000$ ), completion of some college ( $p = .011$ ), household income ( $p = .005$ ), being married ( $p = .001$ ), engagement of sports/exercise ( $p = .039$ ), physical health rating ( $p = .000$ ) and mental health rating ( $p = .000$ ) were statistically significant indicating a relationship with BMI. Model 1 indicated that household income was significantly predictive of BMI. Decreases in household income increased BMI ( $\beta = -.076$ ). Additionally, lower levels of educational attainment and being married were also significant predictor of BMI. Married individuals had a greater BMI compared to individuals who indicated they were single ( $\beta = .085$ ). Self-rated mental health and self-rated physical health were both predictive of BMI. The results indicated as self-rated mental health increased as BMI increased ( $\beta = .088$ ). Self-rated physical health decreases showed an increase in BMI ( $\beta = -.202$ ).

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Table 2.

Simple linear regression examining constructs of the Socioecological Model and BMI. 2001–2003 National Survey of American Life, African American, Females.

	N	M(SD)	Beta (Standardized Coefficients)	Standard Error of Estimate	F	<i>p-value</i>	R2 Adj.
More important to be Black or American (Reference = Both equally important)							
Age	2100	42.72(16.18)	.035	6.73	2.60	.107	.001
Household Income	2100	27,929(25,420)	-.103	6.70	22.36	.000***	.010
Marital Status (Reference = single)							
Married			.059	6.73	4.06	.019*	.003
Divorced			.064	6.73	4.06	.010**	.003
Work Status (Reference = not in the labor force)							
Employed			-.057	6.72	4.67	.021*	.003
Unemployed			-.071	6.72	4.67	.004**	.003
Education (Reference = college graduate)							
Less Than High School			.214	6.66	16.12	.000***	.021
High School			.173	6.66	16.12	.000***	.021
Some College			.106	6.66	16.12	.001***	.021
Physical Health Rating			-.194	6.61	82.15	.000***	.037
Mental Health Rating			-.046	6.73	4.40	.036*	.002
Life Satisfaction			-.012	6.74	.293	.588	.000
Gardening			.023	6.74	1.15	.284	.000
Sports/Exercise			-.125	6.68	33.22	.000***	.015
Walking			-.080	6.72	13.635	.000***	.006
General Anxiety (Lifetime)			.045	6.71	4.26	.039*	.002
General Anxiety (12 Mo)			.044	6.71	4.030	.045*	.001
Depression (Lifetime)			-.005	6.73	.052	.820	.000
Depression (12 Mo)			.025	6.73	1.32	.252	.000
Church Membership			.027	6.70	1.29	.257	.000
Race Problems			-.022	6.74	1.02	.314	.000
Upset by Race Problems			-.036	6.21	.195	.659	-.005
Supermarkets			-.092	6.71	18.05	.000***	.008
Parks			-.076	6.72	12.13	.001***	.005
Medical Centers			-.073	6.72	11.085	.001***	.005
Government Health Insurance Programs			.026	6.74	1.37	.243	.000
Employer Health Insurance			-.030	6.74	1.90	.168	.000
Family's Employer Health Insurance			-.034	6.98	1.27	.260	.000
Purchased Health Insurance Directly			-.036	6.72	2.65	.104	.001
Police Presence			-.061	6.73	7.78	.005**	.003
Crime			-.008	6.74	.132	.717	.000
Drugs			.025	6.72	1.32	.252	.000
p < .05*, p < .01**, p < .001***							

Table 3. Regression models of BMI on Socioecological model (SEM) measures examining the spheres of influence.

	Variables	Model 1	Model 2	Model 3	
<b>Intrapersonal</b>	Age			-.149	
	Marital Status (Reference = single)				
	Married	.085***	-.041	-.039	
	Divorced	.040	.042	.366	
	Work Status (Reference = not in the labor force)				
	Employed	.061*	-.074	-.029	
	Unemployed	-.036	-.050	-.082	
	Educational Attainment (Reference = college graduate)				
	Less than High School	.149***	.067	.125	
	High school	.124***	.175	.146	
	Some college	.081*	-.101	-.302	
	Household Income	-.076**	-.009	-.101	
	How often sports/exercise	-.051*	.088	-.008	
	How often take walks	-.031	-.101	-.197	
	How often garden/yardwork			.213	
	Physical health rating	-.202***	-.205	-.183	
	Mental health rating	.088***	.190	.357	
	Life Satisfaction				
	DSM-IV Generalized Anxiety Disorder (Life T)	.007	-.273	-.137	
	DSM-IV Generalized Anxiety Disorder (12Mo)	.022	.270	.303	
DSM-IV Major Depressive Episode (Lifetime)			.025		
DSM-IV Major Depressive Episode (12 Mo)			.018		
<b>Interpersonal</b>	Church membership		.180	.122	
	Upset by Race Problems		-.024	.080	
<b>Community/ Institutional</b>	Park/playgrounds/open space in neighborhood	-.037	-.071	-.043	
	Supermarket in neighborhood	-.034	.034	-.076	
	Medical clinic in neighborhood	-.032	.034	.164	
	Government Health Insurance			.372	
	Employer Health Insurance			.071	
	Family's Employer Health Insurance			.280	
	Purchased Health Insurance Directly			.019	
	Police station in neighborhood	.002	.085	.300	
	Crime			.251	
	Drugs			-.293	
F	9.84	1.38	1.05		
p-value	.000	.148	.452		
R <sup>2</sup> Adj.	.072	.057	.026		
<i>p</i> < .05*, <i>p</i> < .01**, <i>p</i> < .001***					
Note. Model uses standardized coefficient (Beta).					

## DISCUSSION

The current study purpose was to investigate the relationships between the social determinants of health and BMI among African American women. The study used the socioecological model (SEM) as the framework to examine the SDOH. Data in this study indicated an association between BMI and variables on the intrapersonal and community/institutional levels of the SEM. These findings were not surprising as other studies have reported similar results (Black & Mackinko, 2008; Cohen, Finch, Bower, & Sastry, 2006; Foster & Giles-Corti, 2008).

### Intrapersonal sphere

The intrapersonal sphere relates to variables such as, health habits (i.e. walking and exercise), health status (self-rated physical and mental health) psychological make-up (i.e. episodes of depression and anxiety), family situation, and demographics (i.e. race, gender, income, marital status, education, etc.) which influence personal health behaviors (Sallis and Glanz, 2006). Numerous research studies have assessed the intrapersonal sphere, playing particular close attention to income and education (SES) and health outcomes, finding an association between SES and physical activity, dietary intake, and utilization of care (Caprio et al., 2008). Kumanyika and Grier (2006) reported low-income individuals were more sedentary, had greater numbers of fast food outlets, fewer sources to procure healthy foods, greater incidence of crime, and fewer spaces to engage in physical activity.

### Socioeconomic Status

Socioeconomic status (SES) is a strong predictor of social determinants of health and has an inverse association with a number of health outcomes, such as obesity (Williams and Rucker, 1996). We found a relationship between BMI and SES as defined simply by household income. Participants' BMI showed an increase as the household income decreased. Low income communities, as noted previously, are plagued by crime, devoid of healthy food outlets, and high in environmental hazards predisposing residents to poor health (Tamayo, Herder, & Rathmann, 2010; Williams & Collins, 2001). African Americans often must survive in low income spaces, with approximately half of the African American population living at or below 200% of the poverty line (DeNavas-Walt & Proctor, 2014; Kumanyika et al., 2007).

Education and employment are linked to SES as both are determinants for household income. In this study a relationship was found between education and BMI. African American women with lower levels of education had a greater BMI. Other studies have reported an inverse relationship between education, and BMI (Kumanyika and Grier, 2006). Data showed that in the context of employment African American women that were employed had a greater BMI than women that were not in the labor force. This finding is counter intuitive, as other studies link employment to improvements in health outcomes due to increased income. However, it is plausible that for African American women employment exposes them more to work related stress and racial microaggressions. Bravemen, Egerter, and Williams (2011) discussed the impact of employment on overall health citing health risk due to environmental hazards, lack of work place social supports, and lack of autonomy.

### Marital Status

The data showed that being married in comparison to being single was associated with increases in BMI, this finding was statistically significant in model 1. Likewise, the data showed that being divorced also elevated BMI and this increase was slightly greater than that of married women, but did not reach the level of significance. The increase in BMI for married and divorced

women in comparison to single women could be a spurious effect, with age being a confounding factor.

#### Personal Health Habits

Data from this study showed the engagement in physical activity through sports or exercise to be predictive of BMI, this finding is similar to the current literature on physical activity and obesity (Donnelly et al., 2009; Wing, 1999). The association of physical activity and BMI was a strong interaction within the study and was statistically significant within both the simple linear regression and the multivariate regression model. Intervention studies have demonstrated the importance of energy balance through physical activity and limiting poor quality food intake (Murphy, Roger, & Williams, 2013; Nicklas et al., 2003).

#### Community/Institutional

Access to parks, playgrounds, supermarkets, and medical clinics were shown to have an inverse relationship to BMI. The Black Women's Health Study (BWHS) conducted during 1995-2009, showed an inverse relationship between access to healthy foods and weight gain (Boggs et al., 2011). This relationship demonstrates the importance of access to supermarkets and other sources to purchase healthful foods and obesity. However, when variables representing issues of access to services and resources were included in a large multivariate model access did not predict BMI in Table 2.

#### Neighborhood Safety

This study's results showed an association with BMI and having a police station or substation in the neighborhood only when analyzed alone in Table 2. Safer neighborhoods have been linked to increased physical activity, social capital, and lower rates of obesity (Saelens, Sallis, and Frank, 2003). The addition of other variables to the regression model eliminated the significance of police presence in predicting for BMI Table 3. There is a growing body of evidence that supports the relationship between crime and neighborhood cohesion (Saelens, Sallis, and Frank, 2003). It would stand to reason that the perception of an unsafe neighborhood would reduce the likelihood of utilizing parks and playgrounds, but when placed in the large context of health social determinants police presence may be obscured by other variables.

#### Race & Obesity

In general, these findings reflect the current body of evidence in obesity research. However, some inconsistencies emerged in the analysis of this data. In current African American women's obesity research literature, SES and access to services are not the only factors that have been indicated as major contributors to obesity. Racial discrimination has been reported as a determinant of obesity (Williams and Rucker, 1996). However, the variable "*Race problems*" was not statistically significant in the linear regression and thus was not included in Model 1 (Table 2). The addition of this variable in Model 2 still did not achieve significance (Table 3). Although, this study did not indicate an association with BMI and race problems other studies have indicated a relationship between the two (Crozier, Yu, Coogan Bethea, Rosenberg, and Palmer, 2014; Hunt and Williams, 2011). Also, we did not find insurance coverage to be associated with BMI, nor did we find associations between BMI and involvement with a church.

Race is strongly related to SES, with national data reporting large income disparities between ethnic minorities and European Americans (Williams and Rucker, 1996). Health research in the past examined race from a biomedical perspective, but race now is being examined from a socio-cultural perspective (Kumanyika et al., 2007). This shift in how race is conceptualized in health research points to larger societal implications, rooted in economics and access. However,

controlling for SES does not eliminate disproportionately elevated rates of obesity among African Americans and researchers have begun to point to the role of racism in the determinants of health (Williams and Rucker, 1996). The inability of SES to account for variations within economic status between African Americans and European Americans and the influence of racism have been noted by the HHS (U.S. Department of Health and Human Services, 2015). Reducing and/or eliminating health disparities are a leading goal for Healthy People 2020. In order to meet the established goal researchers need a different approach to addressing disparities. Individual or biomedical interventions have been insufficient. Kumanyika et al (2007) recommends an approach that examines complex pathways of health. Central to this new focus is the knowledge that behaviors are determined by social, cultural, and environmental processes, and these are strongly defined by race/ethnicity (Kumanyika et al., 2007). Research should focus more on the role of these three determinants, examining the interactions of race/ethnicity, income, social status, and environment.

#### Limitations and Strengths

One of the major limitations of this study was that it relied on cross-sectional data, which represents a single point in time. The data collected were self-reported which it not as reliable due to underreporting and inaccurate reporting. It is possible that the measure used to examine race in this study was not specific or sensitive enough to discern the nuances of race, which encompass racism, racial discrimination, racial identity, and internalized stereotypes. Additionally, in trying to examine race further the use of the variable upset by race problems had a low response rate ( $N = 151$ ). Along with the limitations, there were several study strengths. The use of such a large dataset analyzing multiple levels of the SEM makes this study unique. To my knowledge this is the first study to introduce three spheres of influence at one time for study using a nationally represented sample of adult African American females. Making use of this model as framework enabled the examination of the confluences of BMI, intrapersonal, interpersonal, and community/institutional. The current study outcome contributes to a preliminary understanding of the relationships between the intrapersonal, interpersonal, and community/institutional spheres of influence.

#### **CONCLUSION**

This study contributes to the body of knowledge on African American women and obesity through analyzing the data based on multi-dimensional interconnected spheres of influence underpinned by the socioecological model. Through analysis of the NSAL data the role of psychosocial-cultural influences on obesity in a population that has one of the highest prevalence of obesity was able to be explored.

Findings in this study indicate that intrapersonal and community influences have the greatest impacts on obesity rates among African American women. Specifically, physical health rating, mental health rating, educational attainment, being married, and household income had the greatest predictive strength with in model 1. Although, physical and mental health rating were the most significant predictors based on the coefficient, these measures were subjective ratings and the vast majority of participants responded positively to both ratings, indicating good to excellent ratings, 77.1% and 86.4% responding positively about mental health and physical health respectively. Educational achievement and means to improve economic outlook rarely appear in obesity research as a component of a weight loss/weight maintenance intervention program. Providing African American women with the resources needed to improve their financial circumstances, through higher educational attainment leads to increased access to parks,

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playgrounds, and supermarkets due to a greater earning capacity. Additionally, it is possible that improvements in earning capacity and education can increase self-efficacy and self-determination, which both have been correlated with improved dietary patterns and physical activity (Ryan, Patrick, Deci, & Williams, 2008). Future analysis should focus on exploring the relationships between SES, educational status, and obesity; playing special attention to the sociocultural structures that transect the spheres of influence. Additionally, researchers should work towards social restructuring through policies that promote an egalitarian society. Such a society would provide resources and access to the marginalized, allowing for improvements in health outcomes. It is important to remember that the construction of a social environment is based on educational opportunity, jobs, taxation, and housing; all which influences health behaviors indirectly (Sacks et. al., 2009).

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