Race And Health Behaviors: A Study Of Diabetes Among African American Adults.

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RACE AND HEALTH BEHAVIORS: A STUDY OF DIABETES AMONG AFRICAN AMERICAN ADULTS.

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ABSTRACT

This project assesses the effects certain variables have on African American adults that suffer from diabetes. These include behaviors of African Americans that contribute to diabetes such as; diet behavior and physical activity. Although the behaviors of health care professionals and the health care system are important, in this project a data base for the measurement of the appropriate variables is not available. Thus, the focus of this study is to examine the effects of these health behaviors on the likelihood of having diabetes among African Americans. This assessment will be used to provide insights as they pertain to African Americans and diabetes.

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CHAPTER ONE: INTRODUCTION

Over the years, diabetes has increasingly become a problematic disease in the United States. The prevalence of diabetes could possibly be attributed to lifestyles adopted by Americans that are characterized by poor eating habits and physical inactivity that are tied to high prevalence rates of obesity. As communicated by the Centers for Disease Control (CDC), about 23.6 million American citizens suffer from diabetes, this correlates to about a tenth of the adult population (CDC, 2008). Furthermore, over a quarter of the American adult population suffers from obesity (Cynthia L. Ogden, Margaret D. Carroll, Margaret A. McDowell, and Katherine M. Flegal, Nov. 2007). The assessment of diabetes and obesity rates by race suggests vast differences. For instance, in 2007 approximately 53% of non-Hispanic black women 40–59 years of age were obese compared with about 39% of non-Hispanic white women of the same age (Ogden et al. 2007). The diabetes rate for African Americans stood at 14.7%, in comparison with a 9.8% of rate for Caucasian adults (CDC, 2008). These differences suggest an emerging health disparity, that is: "differences in the incidence, prevalence, mortality, and burden of diseases and other adverse health conditions that exist among specific population groups in the United States" (NIH, p. 2498). Evidently, the disparity in diabetes rates seen in African Americans suggests a need for research that addresses the factors related to this disease. It is also important to understand the process that can be used to control this disease.

Diabetes is a debilitating disease responsible for an alarming number of deaths. For instance, the latest report from the CDC (2008) indicates that diabetes was the seven leading cause of death of all Americans. Furthermore, the report notes that diabetes was the fifth leading

cause of death in African Americans ages 45- 64. This alarming trend suggests that diabetes is likely to become an American epidemic for the U.S population, particularly for the African American community.

Diabetes reports suggest that in 2007 about a quarter of people who were 60 years and older suffered from diabetes. According to the National Institute of Diabetes and Digestive and Kidney Diseases (here after seen as NIDDK), rates of type 2 diabetes are higher than those seen in younger adult age groups as older adults are more likely to suffer from diabetes (NIDDK, 2008). Particularly, as a result of body function decrease, including pancreatic function. In fact, Tull and Chambers (2004) suggest that one fourth of the African American diabetic population is between the ages of 60 and 74. Although rates are higher amongst the elderly in general, Caucasians in this age group do not have the same elevated rates as African Americans (Tull and Chambers, 2004).

Several groups (e.g. health practitioners, government agencies and the like) have investigated some of the causal factors behind the diabetes health disparities between Caucasians and African Americans. Their results suggest that the differences might be a result of unhealthy cultural behaviors (food choices, diet and exercise), structural behaviors (accessibility to stores that carry fresh fruits and vegetables, affordability of healthy food choices), and economic factors (affordability and socioeconomic status).

The purpose of this study is to assess certain social behaviors among African Americans that contribute to their high prevalence of diabetes. This will include particular behaviors such as: diet behavior, nutritional education, and physical activity. In particular, the study will investigate the effects of these health behaviors on the likelihood of having diabetes among African Americans. These issues will be tested using data from the National Health and Nutrition

Examination Survey (NHANES) 2005-2006 dataset. The NHANES data set is ideal to test these issues as it has several indicators of health behaviors including: questions that pertain to dietary behavior, physical activity, and diabetic information. Furthermore, this particular dataset includes an over sample of African Americans.

CHAPTER TWO: LITERATURE REVIEW

Diabetes and African Americans

As stated before diabetes is a risk factor of obesity and is becoming a growing health issue. Type 2 (non-insulin dependent diabetes mellitus) diabetes is the most prevalent type of diabetes in the United States. Risk factors that have been linked to type 2 diabetes include: older age, obesity, physical inactivity, and race/ethnicity (Blocker and Forrester- Anderson, 2004). The CDC (2008) reports that African Americans, Hispanic Americans, American Indians, some Asian Americans, and Native Hawaiians have a particularly high risk of experiencing type 2 diabetes. According to the CDC, 3.7 million (14.7%) of all non-Hispanic African Americans aged 20 years or older have diabetes (CDC, 2008, National Institute of Diabetes and Digestive and Kidney Diseases, 2008).

Some of the factors associated to the high incidence of diabetes within the African American community may be related to their culture or health behaviors. Research has indicated an association between health-promoting behaviors (such as a healthy diet and exercise), cultural beliefs and expectations (such as those regarding weight management, traditions, and cooking methods), availability/access to health care practitioners, and trust in the health care system to the incidence of diabetes (Kumanyika et al., 2005; Peek, Tang, Alexander, and Chin, 2008; LaViest et al., 2003).

Another study, Two Feathers, Kieffer, Palmisano, Anderson, Sinco, Janz, Heisler, Spencer, Guzman, Thompson, Wisdom, and James (2005) that have addressed the effectiveness

of intervention programs in battling diabetes in the African American community are particularly important to discuss, since they give insights into some of the cultural health behaviors of this community. For example, Two Feathers et al. (2005) noted that behaviors aimed at improving dietary, physical activity and diabetes self-care behaviors are useful as a method to improve the health of African Americans, particularly as it relates to diabetes and obesity. The authors also suggest that connections between social aspects and health (during intervention programs) must be made by individuals in order to successfully practice self-care behaviors.

Some social aspects posing as intermediate factors contributing to high prevalence of diabetes in the African American community include: access to information and education, stressful conditions (such as work and financial security), and environment (access to care, healthy food choices, and exercising locations) (Schults, Zenk, Odoms-Young, Hollis-Neely, Nwankwo, Lockett, Ridella, and Kannon, 2005). Once high risk members of the African American community adopt healthy food preparation practices, healthy exercising behaviors, and reduce stressful environmental conditions that contribute to diabetes, vulnerability to diabetes may decline (Schults et al., 2005). Counseling provided by a health care practitioner can also improve health behaviors in diabetic patients (Peek et al., 2008).

Studies reveal that a patient's knowledge of the relationship between exercise, healthy diet, and blood glucose level control can have a positive effect on self-care and overall lifestyle change. Baptiste-Roberts, Gary, Beckles, Gregg, Owens, Porterfield, and Engelgau, (2007) examined the relationship between family diabetic history and awareness of diabetes and its risk factors. They concluded that those with a family history of diabetes follow certain positive health behaviors as opposed to those with no family history. They found that African Americans with a family history of diabetes have a higher probability of consuming a healthier diet to include

abundance of fruits and vegetables in addition to getting screened for diabetes (Baptiste-Roberts et al., 2007).

Behaviors That Relate to Obesity: Risk Factor for Diabetes

The United States has a high incidence of obesity with (over 30% in 2000) considered obese (Boardman, Saint Onge, Rogers, Denney, 2005). Obesity rates are particularly abundant among African Americans in the United States. Reports by the CDC (2004) stated that from 2001 to 2004, 66% (2001-2004) of women 20 years and over and 79% (2001-2004) of men 20 years and over are overweight.

Other studies have found the same obesity patterns among African Americans. For example, Paschal et al. (2004, pg. 306) found that the incidence of diabetes was higher for: "55-75% of African American women and 30-66% of men that rarely exercised". Kumanyika et al. (2005) studied race differences in weight loss programs and found that weight loss was more difficult for African Americans than whites, even when taking into account if those enrolled and retained in the (weight loss program) trials were highly motivated for lifestyle changes.

Some of the risk factors that have been associated with obesity in the African American community include: behavioral patterns (Baptiste- Roberts et al. 2007) attitudes about excess weight (Kumanyika et al. 2005), and social- structural aspects of obesity-promoting environments (Kumanyika et al. 2005, Boardman et al., 2005). Behavior (be it detrimental to health or not) can have an effect on the health of an individual. Behavior can include amounts of expended energy (exercising versus a sedimentary lifestyle), eating patterns, types of food ingested, and consumption of alcohol and other unhealthy products. Becker et al. (1977) studied

dietary adherence and health behaviors, they stated dietary adherence is somewhat unusual in the class of health-related behaviors because of three reasons: (1) the threat posed to health is not immediate, but rather, future-oriented and linked to other conditions, (2) appropriate action may be undertaken for non-health reasons (e.g., body image, social acceptance), (3) even when identified as a health problem, obesity may not be regarded by many persons as an "illness" in the usual sense of the term. Kumanyika et al. (2005) assessed how perceptions of normality can play a role in how weight is perceived in the African American community:

> "attitudes about excess weight are generally less negative in African American communities than in white communities and may include perceptions of excess weight as favorable or at least not harmful to health" (pp. 2038).

Hence, perhaps it is considered a good thing to have excess weight in the African American community.

There are social- structural aspects that affect the obesity rates in African Americans. Kumanyika et al (2005) explained that environments promoting obesity are more prevalent in the African American communities than in white communities. The author's also explained that stores in the African American communities do not supply the healthier foods or fresh and frozen produce as the stores do in the middle and higher income areas. Essentially, the low rate of availability of healthier foods and produce, along with a favorable image of excess weight, might be associated with a higher incidence of obesity in the African American community.

Socioeconomic status has also been tested as a factor behind for racial/ethnic differences on diabetes rates. This rationale strives on the idea that the more money (higher the socioeconomic status) an individual has, the more likely they can engage in preventive health measures. However, Schultz et al (2005) examined this and found that African American and

Caucasian differences still exist when controlling for socioeconomic status. Thus, this suggests that there are underlining factors contributing to such a disparity besides socioeconomic status. Schultz et al. (2005) also indicated that the dietary practices, physical inactivity, and other community-specific behaviors specific to the African American community lead to obesity and diabetes. This is inclusive of all socioeconomic statuses in the African American community.

Socioeconomic status and the resulting lifestyles have been hypothesized to be major contributors behind a high prevalence of diabetes in the African American community (Signorello, Schlundt, Cohen, Steinwandel, Buchowski, McLaughlin, Hargreaves, and Blot. 2007). A low socioeconomic status contributes to certain lifestyle factors that can play a role in the prevalence of diabetes. Poor fetal health, lack of preventive healthcare, lower educational level and psychological factors (i.e. depression and such) all pose as social behavior variables that can lead to diabetes in adulthood (Signorello et al. 2007).

Although diabetes is considered a mostly genetic disease, the prevalence of diabetes is not solely based upon genes, yet behavior patterns are believed to be heavy contributing factors. For example, in a study comparing socioeconomic status with educational attainment and behavioral patterns eliminated race as a major contributing prevalence factor for diabetes (Signorello et al. 2007). Differences in the prevalence of diabetes in certain races may be so because of the differences in behaviors between races and thus may be dominant in the African American community.

It is useful to review some of the factors and health behaviors associated with obesity in the African American community as they are closely linked to diabetes. The next section will review what social behaviors are associated to diabetes in the African American community; whether these behaviors are the sole contributors to the development of diabetes. It also includes

a review of other economical, environmental, or cultural factors that influence the health of African Americans.

Social Behaviors in African American diabetic patients

There are several social behaviors amongst African Americans that are believed to lead to diabetes. An extensive list of common behavioral contributors seen in diabetic patients include: high fat or high caloric dietary intake, physical inactivity, and family history. Some health behaviors specific to African Americans include; restricted healthy diet due to limited healthy food choices (Kumanyika et al. 2005), culture specific unhealthy cooking recipes (Kumanyika et al. 2005; Blocker and Forrester- Anderson 2004), low diabetic self- care management (Nwasuruba, Osuagwu, Bae, Singh, and Egede, 2007; Samuel- Hodge, Watkins, Rowell, and Hooten 2008), physical inactivity (Fallon, Wilcox, and Laken, 2006), high obesity levels (Blocker and Forrester- Anderson 2004; Ogden, et al. Nov. 2007) , genetic predisposition (CDC, 2008), and social and psychological stress (Tull and Chambers 2004; Samuel et al. 2008).

African American specific behaviors contributing to the development of diabetes have been found in many of the studies concerning dietary choices and eating habits of African Americans. Among them are: self- care management that includes regular physician visits, a regular healthcare provider, drug adherence, blood- glucose tests, foot exams, eye care, and the like. There is evidence that suggests that in many cases African Americans have a lower probability of receiving preventative care; such as flu and pneumonia shots than their white counterparts (Nwasuruba et al. 2007). Having preventative care may prevent certain

complications to diabetes or even help to prevent diabetes all together. Regular physician visits allow patients to obtain care and counseling about health behaviors that can lead to diabetes and may need addressing. However, documented counseling levels are reported to be low. Fallon et al. (2007) reported that Healthy People 2010 have suggested that physicians counsel patients about increasing physical activity, adapting healthier eating habits, and weight loss at 28%, 40%, and 12% respectively. As stated before, African Americans report more unhealthy behaviors than Caucasians; less physical activity, more obesity related comorbidities, overweight, and eating fewer servings of fruits and vegetables than the recommended amount (Fallon et al. 2007).

Management of blood- glucose levels is imperative in the control of diabetes and an effective way in measuring one's level is through regular testing of the blood. Although some studies suggests that home glucose testing does not differ racially, whites are testing at slightly higher rates than both African Americans and Hispanics (Nwasuruba et al. 2007). Another way to control blood- glucose levels is through drug adherence and exercise. Summerson, Konen, and Dignan (1991) suggested that those diabetic patient's who exercised more than the sedentary group, generally practiced more healthy ways of life. This includes, but is not limited to; having more physician/ dentists visits, having lesser body mass index (BMI), and increase in blood glucose monitoring (Summerson et al. 1991). Other behaviors mentioned by Summerson et al. (1991) were; smoking and alcohol consumption. Both of which were seen in higher levels within the sedentary group when compared to those who exercise.

As mentioned previously, comparatively, African Americans suffer from obesity more than Caucasians. Thus, culturally fitting interventions must be set in place in order to provide methods in changing the behaviors that contribute to diabetes within this population. Changing behaviors through education, program encouragement, and counseling have assisted with

increasing physical activity, changing eating habits, and achieving weight loss (through the introduction of healthy cooking methods and more) (Mayer- Davis, D'Antonio, Smith, Kirker, Martin, Parra- Medina, and Schultz. 2004).

Theory in relation to social behaviors and diabetes

This section will offer a theoretical understanding of how health behaviors and the consequences of these culture-specific behaviors may lead to a higher prevalence of diabetes amongst African Americans.

Many behaviors, including health behaviors, tend to be influenced by income and education levels. Hence, since this study looks at a racial group heavily affected by poverty, relative deprivation theory becomes particularly useful in understanding health behaviors related to diabetes. Relative deprivation occurs when health is objectively impaired as a result of one's socioeconomic measure. Statistically, African American households generally earn about $20,000 less than that of the average Caucasian household (DeNavas- Walt, Proctor, and Smith, 2007). As poverty rates for African Americans for 2007 24.5% and Caucasians are 8.4% (DeNavas- Walt et al., 2007). In relation to this study, objective differences would be those behavior patterns that are specific to African Americans as a result of: having lower socioeconomic status, traditional behaviors that result from ancestral/cultural roots (slaves and low socioeconomic status), and structural limitations that promote an unhealthy lifestyle.

To properly relate the theory used here, certain behaviors are deemed imperative contributing factors to the prevalence of diabetes for African Americans. One argument posed by many researchers is the fact that socioeconomic status determines health outcomes, health

behavior, and environmental barriers that can be contributors of diabetes (Adler and Newman, 2002). These contributors are objectively impairing the health of African Americans of low socioeconomic status as it is not by choice that these barriers contribute to the prevalence of diabetes and other health problems. Schultz et al (2005) explains that although socioeconomic status is imperative when assessing health disparities, racial differences will still be present. These racial differences could be residential segregation, accessibility to quality foods, dietary practices, and social environment; which could be indirectly associated to socioeconomic status. Along with some of these factors, Signorello et al. (2007), ties in unequal health care access as being a factor when assessing the prevalence of diabetes within the African American community. The authors note that as socioeconomic status maybe equal when compared to Caucasian counterparts, access to primary health care is often an issue (Signorello et al., 2007).

To transmit relative deprivation theory to this topic, the above mentioned behaviors have been collapsed into unequal access, economic and structural behavior groups in order to provide clarity of purpose.

- Results from unequal access to: accessibility/availability to healthcare practitioners, awareness of disease and its risk factors (through use of intervention programs or health education), a resultant increased in exposure to psychological stressors.
- Consequences of the economy consist of: socioeconomic status.
- Consequences of structural influences include: social-structural limitations (accessibility to stores that carry fresh fruits and vegetables, affordability of healthy food choices), health-promoting behaviors (such as diet and exercise, and avoidance of smoking and alcoholic beverages), cultural perceptions (attitudes about excess weight), cultural traditions (cooking methods), and family history.

Relative deprivation theory is directly related to the behaviors highlighted in the unequal access group. All of the consequences that relate from such circumstances: accessibility/ availability to healthcare practitioners, awareness of disease and its risk factors, and psychological stressors, are definitely reality in this racial (and socioeconomic status) group are direct disparities found in the community. Socio- structural limitations directly influence health-promoting behaviors which are controlled by cultural perceptions and traditions.

In totality, these three behavioral groups can be based on a collective group ideal. Collectively, relative deprivation can be connected to these behaviors because they result from disparities and structural barriers. As a group, being objectively impaired as a result of disparities and socio- structural limitations may be prominent factors leading to behaviors contributing to diabetes.

Based on the theory and literature review discussed previously, the assessment of the associations between African Americans and various health behaviors (diet behavior and physical activity) will be tested.

CHAPTER THREE: METHODOLOGY

Data

To assess the effects of certain African American health behaviors (diet behaviors and physical activity) on the likelihood of being diagnosed with diabetes, this thesis utilized data from the National Health and Nutrition Examination Survey (NHANES) 2005-2006 dataset. The NHANES dataset offers a plethora of questions that contribute to the study of health behaviors. For instance, the survey asks specific questions that pertain to dietary behavior, physical activity, diabetic information, and other health behavior questions. Furthermore, this particular data set over-samples African Americans to portray a realistic sample of the population. The NHANES dataset is a continuous household survey which dates back to 1971; the 2005-2006 version is the most recent data available for public use.

Variables

Variables used in this project will be:

The dependent variable for this study is diabetes. Diabetes has been assessed by asking respondents whether outside of pregnancy a doctor or health professional told them they had diabetes or sugar diabetes. Response options were (1) Yes, (2) No, (3) Borderline. For this study the variable was recoded into (0) No and (1) Yes. Those who choose the borderline response were included in the yes category as well, since they show at risk tendency for diabetes. This measure of diabetes has been used before in several studies (Nguyen, Magno, Lane, Hinojosa and Lane, 2008) and is believed to be a good indicator of diabetes (Harris, Flegal, Cowie, Eberhardt, Goldstein, Little, Weidmeyer, Byrd- Holt, 1998).

The following independent variables will be included in the analyses. Since the study is interested in what factors are associated with diabetes in the African American community, only those who classified themselves as African Americans were selected, yielding 2710 participants. Income is an important variable because it aids in measuring affordability and the lifestyles that accompany. A higher income indicates more affordability for healthier foods, while lower incomes suggest less affordability for healthier foods and thus the purchasing of more unhealthy foods. Income was measured by asking respondents about their total household income, (reported as a range value in dollars). This variable has been used before and is believed to be a good indicator of income (Wood, 2002). Response options were (1) $0- $4,999, (2) $5,000- $9,999, (3) $10,000- $14,999, (4) $15,000- $19,999, (5) $20,000- $24,999, (6) $25,000-$34,999, (7) $35,000- $44,999, (8) $45,000- $54,999, (9) $55,000- $64,999, (10) $65,000- $74,999, (11) $75,000 and up, (12) Over $20,000, (13) Under $20,000. As the entire family income was included, the missing respondents were estimated and coded as either under or over $20,000. For this reason, the responses were recoded into (1) $0- $4,999, (2) $5,000- $9,999, (3) $10,000- $14,999, (4) $15,000- $19,999, (5) $20,000- $24,999, (6) $25,000-$34,999, (7) $35,000- $44,999, (8) $45,000- $54,999, (9) $55,000- $64,999, (10) $65,000- $74,999, (11) $75,000 and up.

Gender was another independent variable used in this study. Respondents were asked their gender. Response options were (1) Women, (2) Men. The responses were recoded into (0) Men, (1) Women for ease of interpretation.

Health behaviors incorporate many elements that include eating patterns and general knowledge about healthy practices. In this study the elements of health behaviors were divided into three main areas: physical activity, diet behavior, and education/nutrition. Physical activity

was measured on three levels: vigorous activity, average physical activity, and moderate activity participation. These physical activity questions were 3 separate (non- continuous) questions. The higher the activity level signifies healthier respondents. While the lower the activity level suggests the more unhealthy the respondent may be. These measures have been used before in articles and have been valued as good indicators of physical activity (Ham, Kruger, and Tudor-Locke, 2009). Vigorous activity measures the respondent's extensiveness of their activity that includes physical activities including exercise, sports, and physically active hobbies that respondents may have done in the respondent's leisure time or at school over the past 30 days. This was considered by the activity causing heavy sweating or large increases in breathing or heart rate for a continuum of 10 minutes. Response options were (1) Yes, (2) No, (3) Unable to do activity. The responses were recoded into (0) No and (1) Yes for simplicity.

Average activity measures the daily activity of respondents to include activity during work responsibilities and the like. To gauge average activity, respondents were asked to choose from four sentences, which best describes their usual daily activities? Daily activities mentioned includes the respondent's work, housework, going to and attending classes if the respondent is a student, and what the respondent normally does throughout a typical day if retired or unemployed. Response options were (1) sitting during the day and not walking about very much, (2) stand or walk about a lot during the day, but does not have to carry or lift things very often, (3) lifting light loads or having to climb stairs or hills often, (4) doing heavy work or carrying heavy loads. For simplicity measures, this variable was recoded into a nominal (0) No activity and (1) Yes activity. No activity (0) refers to the response sitting during the day and not walking about very much. Activity (1), refers to the responses standing or walking about a lot during the day, but does not have to carry or lift things very often, lifting light loads or having to climb

stairs or hills often, (4) doing heavy work or carrying heavy loads, and doing heavy work or carrying heavy loads.

Moderate activity incorporates some activities that may be more common to some individuals such as brisk walking, bicycling for pleasure, golf, and dancing. Respondents were questioned about their activities of at least 10 minutes that cause only light sweating or a slight to moderate increase in breathing or heart rate? Response options were (1) Yes, (2) No, (3) Unable to do activity. The responses were recoded into (0) No and (1) Yes.

Diet behavior was measured by assessing the amount of times the respondent's eat meals away from home (or prepared outside the home) as the nutrition, portion size, cooking methods or preparation, and ingredients are not controlled by the respondent. Thus, these meals may contain more fat content, higher caloric value than what is recommended, this also includes unhealthy ingredients. Hence, under the assumption that more control of one's portion size being larger than that that is recommended in meals away from home, preparation of meals away from home are more unhealthy than those away from home, and ingredients are less healthy in the meals away from home, the more one eats out signifies a more unhealthy diet behavior. The meals considered for this study are breakfast, lunch and dinner. Unfortunately, the attempts to finding studies that used this NHANES variable were unsuccessful. The question asks the respondent to average the amounts of meals per week they get meals that were not prepared at a home? This measurement include meals from both dine-in and carry out restaurants, restaurants that deliver food to your home, cafeterias, fast-food places, food courts, food stands, meals prepared at a grocery store, and meals from vending machines. Response options were open ended from ranges 0- 21. (0) Never, (5555) More than 21 times per week, (6666) Less than weekly, (7777) Refused, (9999) Don't Know. Collapsing the responses into categories made for

simplification of the analysis. The missing values and (9999) were removed. Thus, recoded values include (0) Never ate out, (1) Sometimes ate out, (2) 1-5 times a week, (3) 6-10 times a week, (4) 11-15 times a week, (5) 16-20 times a week, (6) more than 21 times a week.

Health education and nutrition knowledge is a multi-faceted component in this study, as it can provide researchers with an idea as to why many individuals suffer from obesity, diabetes, and other health problems because of negligence of one's diet behavior or ignorance towards what is healthy nutritional ingestion. For these reasons, these two components within this model (education and nutrition) were measured using two questions; "Heard of food guide pyramid" and "Heard of dietary guidelines". Unfortunately, attempts to finding studies that used these NHANES variable were unsuccessful. This will be addressed in the limitations section. Nonetheless, the measures should be viewed as a strong indicator of health education and nutrition. Respondents were asked about their understanding of the components of a healthy diet, thus if they had any knowledge of 'The Food Guide Pyramid?'. Response options were (1) Yes, (2) No, (7) Refused, (9) Don't Know. The responses were recoded into (0) No and (1) Yes. For the second question pertaining to the education and nutrition component, respondent's knowledge of accurate dietary guidelines were measured by asking if they have heard of the 'Dietary Guidelines for Americans'?" Response options were (1) Yes, (2) No. The responses were recoded into (0) No and (1) Yes.

CHAPTER FOUR: FINDINGS

Analytical Plan

Descriptive frequencies were run to provide general information of the variables used. Table 1 shows all the statistics for the variables including standard deviations, ranges, and means. Overall, descriptive frequencies communicate that almost 8% of the sample population (N=199) have been told they have diabetes, approximately a third of the sample population have heard of dietary guidelines, about 70% have heard of the food guide pyramid, a little over half of the sample population have participated in vigorous activity and moderate activity in the past 30 days, about 40% participate in some form of daily physical activity, the mean household income level was in between $25,000 and $34,999, the average person in this study eats out slightly less than 1-5 times per week, and gender make up was nearly equal.

As about 14.7% of African Americans (14.7%) aged 20 years or older have diabetes, this particular finding is concerned to be under the expected value (CDC, 2008, National Institute of Diabetes and Digestive and Kidney Diseases, 2008). This may be caused by the low population (N) of African Americans respondents with diabetes (that participated in NHANES) or individuals diagnosed with diabetes were untruthful in answering this question. Summerson et al. (1991) discussed that physically active individuals generally practice more healthy ways of life. Thus, the findings deem valid as a large number of the respondents understands proper diet behavior (food pyramid) and participate in some type of physical activity (vigorous, moderate, or daily). As a contrast, previous studies suggest that African Americans fail to participate in the recommended amounts of weekly physical activity of 300 minutes per week (Fallon et al. 2007,

Wood, 2002). This study did not measure the physical activity as time in minutes was concerned, it specifically asked for activity in the past 30 days. The median income for African Americans assessed by the U.S. census was $34,001, which is valid compared to the mean income (between $25,000 and $34,999) in this study. One explanation for the high rate of obesity is the rise of tendency of eating out; the rise in obesity thus causes higher rates of diabetes (Blocker and Forrester- Anderson, 2004). Theoretically, the more one eats meals away from home, the more likely one will suffer from being overweight and therefore increasing their potential to develop diabetes. The findings in this study suggest that respondents seldom eat meals away from home (1-5 times per week), thus the potential for development of diabetes would be low if this were a primary predictor.

In comparison, descriptive frequencies (Table 2) were also run to compare findings between diabetic and non-diabetic respondents with the predictors of the study. As all of the independent variables were separate measures, cross-tabulations communicated that activity measures were highly correlated and thus significantly related to one another. As more diabetics participate in moderate and daily activity when compared to non-diabetics. Whereas more than double the amount of diabetic's do not participate in daily activity when compared to non-diabetics as rates are 38% and 12% respectively. As one may have assumed, more non-diabetics participate in vigorous activity when compared to diabetics. These findings also suggested that more diabetics than non- diabetics had heard of both the food guide pyramid and dietary guidelines. The majority of both non-diabetics and diabetes eat out 1-5 times per week (60% and 55% respectively). A great part of both the diabetic and non- diabetic population had a household income level between $25,000 and $44,999, however, more diabetics fell in lower income categories than non-diabetics.

Table 1: General Characteristics of Population

Variable	Mean	Standard Deviation	Range
Doctor ever told you have diabetes	.08	.265	0-1
Heard of dietary guidelines	.34	.475	0-1
Heard of food pyramid	.68	.467	0-1
Vigorous activity over past 30 days	.50	.500	0-1
Moderate activity over past 30 days	.56	.496	0-1
Activity (Level of daily activity)	.4262	.4946	0-1
No activity (Level of daily activity)	.1376	.345	0-1
Annual House Income	6.50	3.11	1-11*
Number of times/week eat meals not from a home	1.85	.945	1-6**
Gender	.500	.500	0-1

* (1) $0- $4,999, (2) $5,000- $9,999, (3) $10,000- $14,999, (4) $15,000- $19,999, (5) $20,000- $24,999, (6) $25,000-$34,999, (7) $35,000- $44,999, (8) $45,000- $54,999, (9) $55,000- $64,999, (10) $65,000- $74,999, (11) $75,000 and up

** (0) Never ate out, (1) Sometimes ate out, (2) 1-5 times a week, (3) 6-10 times a week, (4) 11-15 times a week, (5) 16-20 times a week, (6) more than 21 times a week

Table 2: Diabetic versus Non-Diabetics

Variables	**Diabetes N=199**	**Non-Diabetes N=2452**
Vigorous activity over past 30 days	34 (17%)	870 (35%)
Moderate activity over past 30 days	94 (47%)	929 (38%)
Activity	115 (58%)	1040 (42%)
No Activity	76 (38%)	297 (12%)
Heard of food guide pyramid	90 (45%)	938 (38%)
Heard of dietary guidelines	56 (28%)	463 (18%)
Number of times per week eat meals not from a home**	0= 24 (12%) 1= 45 (23%) 2= 109 (55%) 3= 14 (7%) 4= 6 (3%) 5= 1 (.5%) 6= 0 (0%)	0= 221 (9%) 1= 356 (14.5%) 2= 1473 (60%) 3= 224 (9%) 4= 73 (3%) 5= 12 (.4%) 6= 18 (.7%)
Annual Household Income*	1= 2 (1%) 2= 28 (14%) 3= 19 (9.5%) 4= 9 (4.5%) 5= 17 (8.5%) 6= 22 (11%) 7= 26 (13%) 8= 16 (8%) 9= 9 (4.5%) 10= 2 (1%) 11= 34 (17%)	1= 123 (5%) 2= 154 (6%) 3= 239 (10%) 4= 154 (6%) 5= 152 (6%) 6= 301 (12%) 7= 279 (11%) 8= 259 (10.5%) 9= 129 (5%) 10= 118 (5%) 11= 402 (16%)

* (1) $0- $4,999, (2) $5,000- $9,999, (3) $10,000- $14,999, (4) $15,000- $19,999, (5) $20,000- $24,999, (6) $25,000-$34,999, (7) $35,000- $44,999, (8) $45,000- $54,999, (9) $55,000- $64,999, (10) $65,000- $74,999, (11) $75,000 and up

** (0) Never ate out, (1) Sometimes ate out, (2) 1-5 times a week, (3) 6-10 times a week, (4) 11-15 times a week, (5) 16-20 times a week, (6) more than 21 times a week

Logistic regressions were conducted to assess how well the health behaviors African Americans practice (independent variables) predicts the likelihood of being told they have diabetes (by a physician). The dependent variable (doctor told you have diabetes) is a dichotomous variable whereas, the independent predictor variables, heard of dietary guidelines, heard of food pyramid, vigorous activity over past 30 days, moderate activity over past 30 days, activity/ no daily activity, annual household income, number of times/week eat meals not from home, and gender) consisted of a combination of continuous or categorical variables. Three models were conducted in order to assess the importance of each predictor variable group, i.e. health behaviors; physical activity, diet behavior, and nutrition education. Each model evaluates the strength of the relationship noted between the behavior and the likelihood of having diabetes. The regressions were computed using SPSS 14 (2001).

Logistic Regression Model 1 (Diabetes and Nutrition Education)

This particular logistic regression model was performed to evaluate the impact the nutrition education predictors (heard of dietary guidelines and heard of food pyramid) have on the likelihood that respondents would report that their doctor has told them they have diabetes. The results indicate a significant negative association between hearing of the food pyramid and diabetes ($B=-.934$, $p<.01$). Thus, those who answer in the affirmative about the food pyramid guidelines had higher odds (exp $B=.393$) of not having diabetes, than those who answer otherwise. Dietary guidelines were not significantly associated to diabetes.

Logistic Regression Model 2 (Diabetes, Nutrition Education, and Physical Activity)

This logistic regression model adds another element by evaluating the impact the predictors of model one as well as the health behavior of physical activity on the likelihood that respondents would report that their doctor has told them they have diabetes. This model, which contains two of the two health behavior grouping predictors (nutrition education and physical activity), showed negative associations between food pyramid and diabetes ($B=-.758$, $p<.01$), vigorous activity and diabetes ($B=-1.257$, $p<.01$), and activity and diabetes ($B=-.424$, $p<.05$). Thus, those who answered in the affirmative about hearing of the food pyramid guidelines (exp B=.468), vigorous activity (exp B=.285), and daily activity participation (exp B=.655) had higher odds of not having diabetes when compared to the other answers. Dietary guidelines were not significantly associated to diabetes.

Logistic Regression Model 3 (Diabetes, Nutrition Education, Physical Activity, Diet Behavior)

This logistic regression model assesses all of the health behaviors included in this study, Nutrition Education, Physical Activity and Diet Behavior on the likelihood that respondents would report that their doctor has told them they have diabetes. The results indicate a significant negative association between hearing of the food pyramid and diabetes (B=-.629, $p<.01$), vigorous activity and diabetes (B=-1.305, $p<.01$), daily activity and diabetes (B=-.464, $p<.05$), number of times eat out per week (B=-.208, $p<.05$). Thus, those who answer in the affirmative about the food pyramid guidelines (exp B=.533), vigorous activity (exp B=.271), daily activity (exp B=.629), and number of times eat out per week (exp B=.812), all had higher odds of not having diabetes than who answered otherwise. Dietary guidelines showed no significant associations to diabetes. Household income showed no significant associations to diabetes as well.

Table 3: Thesis Models

Variable N=2710 (total) N= 199 (diabetes)								
Model 1			**Model 2**			**Model 3**		
	B	**Exp (B)**		**B**	**Exp (B)**		**B**	**Exp (B)**
Heard of dietary guidelines	.182	1.200		.116	1.124			1.153
Heard of food pyramid	-.934***	.393		-.758***	.468		-.629***	.533
Vigorous activity				-1.257***	.285		-1.305***	.271
Moderate activity				.469	1.598		.408	1.617
Activity				-.424***	.655		-.464***	.629
Number of times/week eat meals not from a home							-.208***	.812
Annual Household Income							-.017	.983
Gender							.390	1.477

* p <.10, **p <.05, *** p<01

CHAPTER FIVE: CONCLUSIONS

This study demonstrates both the overall prevalence diabetes to all individuals as well as the prevalence of diabetes specific to African Americans. As this study has displayed, much research has been complied in studying the disparities that contribute to the prevalence of diabetes within the African American community (many of which has not yet been linked as a causal factor to diabetes). This study has demonstrated that health behaviors to include knowledge of food guide pyramid, vigorous and moderate activity within the past 30 days, daily activity, and the frequency of eating meals away from home are all imperative predictors towards contributing to diabetes. Hence, the life style (or health behaviors) of the individual is more important than income of the individual, these health behaviors are prime in assessing the likelihood that one may develop diabetes because of the health behaviors that the individual participates in.

As there are many behaviors that contribute to diabetes, models were assessed to determine the likelihood each model of the processed logistic regressions has on the development of diabetes. Model 1 demonstrates that understanding the importance of (nutritional education) daily consumption of certain food groups and the serving amounts that follow lend for healthier lifestyles and thus are less likely to develop diabetes. As hearing of dietary guidelines were less significant in this model, this suggests that African Americans may not have an emphasis on the food sources that are recommended and thus may only ingest the foods that are common to the culture. When compared to the food pyramid, which suggests the amount of meats, vegetables, dairy products, fruits, and the like, dietary guidelines have suggestions in more detail. Dietary guidelines are inclusive of BMI, caloric intake, healthy food

sources, and more. Due to cultural factors, economic limitations, or socio- structural limitations suggested in the literature; statistically, African Americans are less likely to have heard of dietary guidelines.

Literature has suggested that African Americans do not partake in as much physical activity as guidelines suggests (Fallon et al. 2007), thus this study reviewed physical activity amongst other health behaviors that African Americans participate in the past 30 days. Model 2 reveals the impact of nutritional education (food guide pyramid and dietary guidelines) and physical activity (vigorous, moderate, and daily) on the likelihood of developing diabetes. Findings of this model suggests that when assessing the impact of hearing about food pyramid and participating in regular physical activity, odds of developing diabetes are lowered. In contrast, statistical findings still suggests African Americans are less likely to have heard of dietary guidelines. The most prominent predictor in this model deems that vigorous activity is the most important variable when assessing the likelihood of not developing diabetes.

The Schultz et al. (2005) study hypothesized that health behaviors (especially those that promote obesity) are greater predictors of the prevalence of diabetes when compared to those (health behaviors) of Caucasians. Although socioeconomic status is an important contributing factor to the prevalence of diabetes, it can not fully explain the prevalence of diabetes in the African American community. Thus, the last model of the study includes all health behaviors, income, and gender in the assessment. The importance of all factors incorporates a degree of socioeconomic status (which involves affordability measures), and gender. The addition of income evaluates the economic barriers addressed in the literature review, which includes affordability of healthier foods and physical activity services (i.e. gym) and socio-structural limitations. This regression suggested that income is not a contributing factor in the likelihood of

predicting diabetes. Thus, health behaviors that include higher levels of activity and knowledge of food pyramid are stronger predictors whereas income and knowledge of dietary guidelines are the weakest predictors.

This study suggests that several health behaviors are important in predicting diabetes. Hence, the individual's lifestyles (that includes everything from social-structural limitations, health-promoting behaviors, cultural perceptions, cultural traditions, and socioeconomic status) are important in the likelihood of predicting diabetes. Unfortunately, the NHANES 2005-2006 dataset did not have measurements for many of the factors that could contribute to one's health behaviors specifically: social- structural limitations, cultural perceptions and traditions, and dietary guidelines and food pyramid. Some other limitations for the literature include the inadequate amount of literature that exist pertaining to culture aspects that contribute to health behaviors, and literature on accessibility to fresh produce and healthier foods. Future research suggestions accounts for the implementation of cultural aspects when assessing predictors of diabetes and other ailments. These factors are easily overlooked and could very well be a primary contributor behind disparities or high prevalence within a certain racial group.

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