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Association of MyPlate Diet and Exercise with Diabetes in African American Women

Brandi Jones
Walden University

Walden University

College of Health Professions

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Brandi Jones

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Review Committee
Dr. Hebatullah Tawfik, Committee Chairperson, Public Health Faculty
Dr. Gwendolyn Francavillo, Committee Member, Public Health Faculty
Dr. Namgyal Kyulo, University Reviewer, Public Health Faculty

Chief Academic Officer and Provost
Sue Subocz, Ph.D.

Walden University
2022

Abstract

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MHA, Walden University, 2015

BS, Indiana University, 2001

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Public Health

Walden University

April 2022

Abstract

Lifestyle choices such as diet and physical activity have been described as significant predictors of preventable disease, such as Type 2 diabetes mellitus. African American women disproportionately develop Type 2 diabetes and are at greater risk, compared to Caucasian/European Americans. The purpose of this study was to examine the association of physical activity and adherence to the MyPlate diet plan with the occurrence of Type 2 diabetes among African American women. The health belief model was the theoretical foundation for this study. Research questions were designed to examine the extent to which diet and physical activity predict Type 2 diabetes. In this quantitative cross-sectional study, data from the 2015-2016 National Health and Nutrition Examination data sets were analyzed, including a representative sample of African American women, ages 18 and older in the United States. Using SPSS, a series of binary logistic regressions were conducted. After controlling for age, there was no statistically significant association between the MyPlate dietary pattern adherence and diabetes (OR = 0.706, 95% CI [0.292, 1.707], p > 0.005). Similarly, no statistically significant association between exercise and diabetes status was observed among this population (OR = 1.032, 95% CI [0.721, 1.504], p > 0.005). Implications for potential positive social change that could arise from this research include encouraging additional research into other dietary plans that may be better correlated with diabetes prevention. Likewise, researchers, health promotion advocates and public health professionals can build on these findings to expand research and examine lifestyle choices that may bring about improved health outcomes among African American diabetics.

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Dedication

"I can do all things through Christ who strengthens me" (Philippians 4:13). I am grateful to God for his favor and blessings he has bestowed upon me and for the endurance he provided me to complete this study. I dedicate this study to my family, who encouraged me to pursue any and all of my passions without judgment. Finally, I would also like to dedicate this dissertation to all the future scholars: Never give up!

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Section 1: Foundation of the Study and Literature Review

Introduction

Lifestyle choices, such as diet and physical activity, have been described as significant predictors of preventable diseases in the United States, including obesity and diabetes mellitus (Hartley, 2014). According to the Centers for Disease Control and Prevention (CDC, 2015), more than 29 million Americans now live with Type 2 diabetes, and another estimated 86 million with prediabetes. The American Diabetes Association (ADA, 2017) estimates 4 million annual incidences of diabetes, with millions still undiagnosed. Complications of diabetes can lead to heart disease, stroke, and kidney problems (ADA, 2017). Estimated prevalence of diagnosed diabetes by race has shown rates to be highest among American Indians/Alaska Natives Hispanics, and non-Hispanic Blacks (CDC, 2020). Although significant evidence supports the relationship among Type 2 diabetes, nutrition, and physical activity, there is still a paucity of research in African American women. Overall, making lifestyle changes can dramatically help reduce disease risk and lower chances of developing Type 2 diabetes (Chan, 2017).

Educational tools, such as Choose MyPlate, provide guidelines for diet and physical activity. MyPlate is the U.S. Department of Agriculture's current nutrition guide that replaced MyPyramid in 2011. Published by the Center for Nutrition Policy and Promotion, the MyPlate plan depicts a place setting, including a glass and plate, divided into five food groups (ADA, 2017). Additionally, physical activity guidelines for Americans were published by the U.S. Department of Health and Human Services (USDHHS). These guidelines include the types and amounts of physical activities

recommended to offer substantial health benefits (CDC, 2017). These tools can be used to promote lifestyle and behavioral changes. More research into the process of behavioral change can reveal opportunities for risk reduction, effective interventions, and improved outcomes (Hartley, 2014).

In multiple studies, researchers have found that lifestyle factors can significantly influence Type 2 diabetes risks (Richardson, 2015). Determining why certain behavioral patterns are more frequently adopted than others can give additional insight into how to address disease prevention efforts. Finally, improving knowledge of health risks can work to reduce disease prevalence and health complications in the future (Richardson, 2015).

Social change implications of this study include health education and information to increase wellness and reduce disease risk. The results of this study can be used to learn more about dietary habits among African American women. This may contribute to positive social change by encouraging African American women to make lifestyle changes and health practitioners to promote wellness and preventive health services in their practices. Additional research is needed to address disparities in diabetes-specific issues such as diet and exercise (Kershaw, 2016). As such, this research study was designed to examine African American women's knowledge of lifestyle and behavioral practices as they relate to disease prevalence and prevention.

Problem Statement

This study is significant because the literature projects that nearly 50% of Black or African American women born from the year 2000 onward are likely to develop Type

2 diabetes in their lifetime (ADA, 2017). Physical activity and weight management are lifestyle factors associated with the prevention of diabetes and diabetes-related complications (CDC, 2020). Information from this study can help prevent or delay the onset of Type 2 diabetes by providing evidence of unique lifestyle and behavioral influences and risk factors that exist in African American women in the United States. Additionally, there may be a need to tailor healthcare interventions to elicit behavioral changes that could help reduce these risks. Lifestyle changes by individuals have shown favorable effects, but initiating a change in these habits can be a complex process (Hartley, 2014).

Although various studies have shown effective relationships between lifestyle changes and Type 2 diabetes, there has not been enough research in the field related specifically to diet and the use of MyPlate in African American women. The MyPlate guidelines are intended to be a guide for Americans to eat and be healthier. Regarding diabetes and blood glucose levels, the MyPlate recommends half the plate be made up of vegetables and fruit, allowing for an increased intake of carbohydrates (Hughes, 2018). MyPlate also recommends eating certain portions of these foods, as a way to manage diabetes in adults (ADA, 2017). This particular study can help us understand how lifestyle factors can affect Type 2 diabetes risks. Other factors to consider may include the control and management of this condition. In a climate of various public health interventions, there is a need to understand the impact of this nutrition plan. Limited studies have been conducted using the MyPlate method to quantify the association between diet and Type 2 diabetes, but none have used MyPlate in a study of African

American women. Such a study provides an opportunity to observe health improvements as individuals receive quality health information, follow the recommended plan, and practice healthy behaviors.

Likewise, various researchers have found a positive relationship between physical activity and reduction of Type 2 diabetes diagnoses (Crawford et al., 2015). However, there is limited available information on how this relates to African American women in the United States. Specifically, the USDHHS (2008) established physical activity guidelines for American adults. These guidelines were intended to help Americans understand the amounts and types of exercises that offer health benefits. Various recommendations included simple instructions, such as moving more and sitting less, to those more specific, including 150 minutes of moderate–intense physical activity per week. Although exercise types have often been researched, specific frequency and intensity levels are still unknown regarding reaching optimal health and reducing disease risks. Little evidence has been reported on the prevalence of Type 2 diabetes in African American women when participating in physical activity at specific frequency and intensity levels. This study helps to fill the gap in literature by providing a better understanding of how the lack of healthy choices, including diet and physical activity, can affect diabetes risk in African American women. The results of this study can also address the need to invest in public health interventions that decrease health risks and yield the most favorable outcomes.

Purpose

The purpose of this quantitative study was to examine predictors of Type 2 diabetes, including lifestyle factors (diet and exercise), in African American women over the age of 18 in the United States. The goal of this study was to fill a gap in the literature regarding the association between the MyPlate diet and physical activity and diabetes among African American women over the age of 18 in the United States. Current U.S. statistics show a disproportionately higher burden of chronic diseases among certain racial and ethnic groups, with increasing complex influences due to unique lifestyle and behavioral factors (Chuang et al., 2017). Prior researchers have found that, compared with Caucasian Americans, racial minority groups are at greater risk for both Type 2 diabetes and obesity (Richardson, 2015).

Several studies have been conducted to examine the association between lifestyle factors and diabetes in specific racial groups, but there has been minimal focus on how these associations may differ in women, particularly African American women. According to Weil (2017), racial and ethnic groups have been disproportionally affected by obesity, Type 2 diabetes, and other risk factors related to chronic diseases. Diabetes has reached epidemic proportions among African American women; 1 in 4 African American women 55 years and older are diagnosed with the disease (ADA, 2017).

Background/Synthesis

Research has been conducted with a focus on disease prevention that includes diet, exercise, and weight management in cultural communities. Weil (2017) found that certain foods can help reduce and even reverse adverse health effects and chronic disease.

These foods include steamed salmon, asparagus, cherry walnut bites, and sundried tomato salads. Similarly, the American Journal of Health Studies (2015) found that eating a more plant-based, Mediterranean-style diet has also been beneficial in preventing and managing disease conditions. This evidence-based approach to nutrition includes fruits, vegetables, whole grains, fish and nuts, poultry, and low-fat dairy. These prior studies have confirmed that eating whole and plant-based foods is beneficial to health.

Hartley (2014) discussed how poor lifestyle choices, such as lack of physical activity, can contribute to serious health conditions such as Type 2 diabetes. Although some providers encourage healthy behaviors to prevent or manage chronic conditions, many patients are not adequately prepared to make these lifestyle changes. Patients may lack the behavioral skills to apply these practices daily (Hartley, 2014).

A sedentary lifestyle, exercising less than 3 days a week, can lead to Type 2 diabetes (Taylor, 2020); additionally, regular physical activity can contribute to good health and well-being. According to the National Institutes of Health (NIH, 2018), moderate physical activity such as brisk walking can reduce Type 2 diabetes risks. Exercising 30 minutes per day 5 days a week is a general recommendation for disease prevention. Effoe et al.'s (2017) Jackson heart study findings defined the ideal physical activity amount as ≥ 150 minutes of moderate intensity activity or ≥ 75 minutes of vigorous activity or ≥ 150 minutes of combined moderate intensity and vigorous activity per week. Intermediate physical activity was defined as 1 to 149 minutes of moderate intensity activity or 1 to 74 minutes of vigorous activity or 1 to 149 minutes of combined

moderate intensity and vigorous activity per week; poor physical activity was defined as no amount of activity (0 minutes) per week (Effoe et al., 2017).

Various influences may increase risk and mortality rates among this population. First, the prevalence of Type 2 diabetes in African American women is high (Palmer et al., 2017). Diet and lifestyle behaviors are modifiable risks and can be shaped by culture (Kershaw & Pender, 2016). The National Health and Nutrition Examination Survey (NHANES, 2017) data have shown the segregation of African Americans with diabetes has been associated with increased mortality rates. Nutrition and exercise patterns have not been well investigated among African Americans, specifically as it relates to being modifiable risk factors for Type 2 diabetes (Palmer et al., 2017). Furthermore, data on how Type 2 diabetes can affect health risks and mortality rates in African American women remains lacking (Palmer et al., 2017). In sum, racial health disparities in Type 2 diabetes are likely due to social, cultural, environmental, and biological factors that have yet to be investigated (Kershaw & Pender, 2016).

Research Questions and Hypotheses

The purpose of this study was to examine the association between the MyPlate diet and physical activity and Type 2 diabetes among African American women over the age of 18 in the United States. The following research questions and hypotheses guided this study:

RQ1: Is the overall prevalence of Type 2 diabetes in African American women in the NHANES survey comparable to that of African American women nationwide?

$H_0$1: The overall prevalence of Type 2 diabetes in African American women in
the NHANES survey is comparable to that of African American women
nationwide.

$H_1$1: The overall prevalence of Type 2 diabetes in African American women in
the NHANES survey is not comparable to that of African American women
nationwide.

RQ2: Is the MyPlate diet associated with the occurrence of Type 2 diabetes in
African American women in the United States?

$H_0$2: The MyPlate diet is not associated with the occurrence of Type 2 diabetes in
African American women in the United States.

$H_1$2: The MyPlate diet is associated with the occurrence of Type 2 diabetes in
African American women in the United States.

RQ3: Is physical activity associated with the occurrence of Type 2 diabetes
among African American women in the United States?

$H_0$3: Physical activity is not associated with the occurrence of Type 2 diabetes
among African American women in the United States.

$H_1$3: Physical activity is associated with the occurrence of Type 2 diabetes among
African American women in the United States.

Theoretical Foundation

Several models and theories have been used to address behavioral change,
including the social–ecological model and health belief model. Although the social–
ecological model is used to describe how various social factors can influence decision

making, for this study, I used the health belief model to understand particular behaviors. Hochbaum (1958) described how the underlying concept of the health belief model focuses on how health behavior is determined by disease perception, personal beliefs, and strategies to reduce occurrence. The health belief model stipulates that health-related behavior is influenced by a person's perception of the threat posed by a health problem and by the value associated with their actions to reduce the threat, which can include individuals' perceived beliefs, including benefits and risks (USDHHS, 2017). If a person's belief about health and wellness justifies their actions, the health belief model can help provide an understanding of how the individual may react.

Skinner et al. (2015) described how the underlying concept of the health belief model focuses on how health behavior is determined by disease perception, personal beliefs, and strategies to reduce occurrence. There are six constructs of the health belief model: (a) perceived susceptibility, (b) perceived severity, (c) perceived benefits, (d) perceived barriers, (e) self-efficacy, and (f) cues to action (Carico et al., 2020). *Perceived susceptibility* refers to a person's perception of the risk of acquiring a disease or illness and may include an adverse outcome an individual could likely experience. *Perceived severity* refers to a person's feelings on the seriousness of contracting a disease or illness. In this situation, a person is considered more likely to take action if the threat of disease is large. *Perceived benefits* refer to a person's perceptions of the effectiveness of actions available to reduce the threat of disease or illness and may include the benefits the individual expects to accrue by undertaking the behavior. *Perceived barriers* refer to the things an individual feels may prevent them from making the desired behavior change

and can include a variation of feelings, including perceptions that something is too

expensive, time consuming, or dangerous. *Self-efficacy* is the belief that one has the

power to overcome a challenge, the level of a person's confidence in the ability to

successfully perform a behavior. *Cue to action* is the stimulus that triggers the decision-

making process to accept a recommended health action. These cues are prompts that

remind individuals that they should act on a particular challenge.

Individual beliefs about wellness and health provide collective reasoning for

justifying both current and future actions. This construction of health can be understood

from both cultural and interpretive frameworks (Robinson et al., 2015). To reduce risk of

diabetes and maintain desired levels of glycemic control, modifying lifelong behaviors

such as diet and physical activity may be a difficult goal to surmount (Robinson et al.,

2015). Application of the health belief model will be applied to help understand

reasoning, including cultural and social perspectives, of why these behaviors persist

among the population, and how lifestyle modifications can impact risk.

Nature of the Study

The nature of this study was a quantitative cross-sectional design conducted to

understand and view differences between those who have incorporated behavioral change

interventions and those who have not. Data used in this study were secondary data from

the NHANES. The NHANES data set included information on the use of MyPlate and

the frequency of physical activity among African American women. The data were used

to explore the effects of nutrition and exercise as they relate to diabetes and diabetes

prevention. This cross-sectional approach allowed for assessments of the adherence to specific dietary and exercise patterns.

Literature Search Strategy

The NHANES is a primary source of information on the health of the U.S. population. The NHANES data set is specifically designed to assess the nutrition and health status of U.S. children and adults. Major objectives of the NHANES are to monitor trends in risk behaviors, prevalence, and treatments and to study the relationships among diet, nutrition, and health (CDC, 2019). This survey combines both physical examinations and interviews to address a broad range of topics, including medical conditions, physical activity, and other health behaviors (CDC, 2018). Findings from this survey are often used to determine the prevalence of major diseases and risk factors for disease (CDC, 2019). Many health promotion and disease prevention programs have been implemented due to information based on these data (CDC, 2018). A downloadable public use data file was accessed through the CDC's file server. The file encompassed questionnaires, data sets, and various documentation from surveys and data collection systems. By collecting these data at various levels—state, local, and national—the NHANES has become a powerful tool for targeting and building health promotion activities in the health and wellness fields.

The reliability and validity of these data can be assessed from a variety of sources. To produce reliable statistics, NHANES oversamples African American populations. Additionally, organizations such as the NIH, the U.S. Food and Drug Administration, and the CDC rely on NHANES to provide data essential for the implementation and

evaluation of various programs (CDC, 2019). This is a particular strength of the

NHANES program. To ensure effectiveness or validity, an advanced computer system

collects and processes all the NHANES data. These systems are programmed with built-

in consistency checks to reduce data entry errors. After collection, interview data are then

reviewed by the NHANES field office staff for accuracy and completeness (CDC, 2019).

Literature Review Related to Key Variables

Type 2 Diabetes

Diabetes is a disease that affects the way a body handles sugar in the blood

(WebMD, 2017). While there are various types of diabetes, most people with the

condition have Type 2; about 27 million people are living with Type 2 diabetes, which

accounts for over 90% of all diabetes cases in the United States (ADA, 2020). Type 2

diabetes, also called *noninsulin-dependent diabetes*, is one of the most common forms of

diabetes (ADA, 2017). Type 2 diabetes is a condition that occurs when a patient's blood

glucose is too high (Hicklin, 2018). With this condition, also known as *hyperglycemia*, a

patient's body does not use insulin properly, known as *insulin resistance* (ADA, 2017).

Insulin is a hormone that allows the cells to convert glucose from food into energy

(WebMD, 2017). Initially, the pancreas makes extra insulin to compensate for the

resistance, but over time, the pancreas is unable to maintain blood glucose levels at a

normal range.

There are several factors that can contribute to Type 2 diabetes. Uncontrollable

factors may include age, ethnicity, and family history. However, various controllable

factors include physical activity, healthy eating, and weight management (Mayberry et

al., 2016). Being overweight and obese, being physically inactive, having poor dietary habits, and fasting hyperglycemia are all modifiable risk factors for developing diabetes (Effoe et al., 2019). Various nutrition plans such as MyPlate may influence risks as will following physical activity recommendations set by the USDHHS. Making small adjustments and lifestyle changes in accordance with exercise and weight management recommendations can help reduce risks of Type 2 diabetes (ADA, 2017).

Incidence and Prevalence

While diabetes is prevalent among various racial and ethnic groups, marked disparities have been found among different races and ethnicities (Hicklin, 2018). In the United States, African American women have higher rates of Type 2 diabetes than Caucasian women (ADA, 2019). Over the last 30 years, this racial disparity has been rising (NIH, 2018). Biological risk factors, such as weight and midriff fat, are primarily responsible for increased rates of diabetes for African American women, compared with White women (NIH, 2018). The prevalence of Type 2 diabetes has reached epic proportions in the United States (NIH, 2018). According to a Morbidity and Mortality Weekly Report, 23 million U.S. adults had been diagnosed with diabetes (Bullard et al., 2018). Given the rapidly increasing prevalence of the condition, the morbidity and mortality rates of diabetes are likely to worsen (Hupfeld & Olefsky, 2016). However, national data on the prevalence of Type 2 diabetes are scarce among certain U.S. adult populations.

In 2016, National Health Interview Survey (NHIS) self-reported data revealed that 8.6% or approximately 21 million survey participants reported having a diagnosis of

Type 2 diabetes (Bullard et al., 2018). The NHIS is an annual survey conducted by the

CDC that gathers health-related data in a specific sample of the U.S. population. This

cross-sectional household interview survey is conducted through face-to-face interviews

in which respondents may be asked whether a doctor or healthcare provider has ever told

them they have diabetes (Bullard et al., 2018). Understanding the prevalence of Type 2

diabetes diagnoses is important for assessing the burden of disease and prioritizing

national plans for future health services (Bullard et al., 2018). The study may also address

more specific questions such as glucose levels, diabetes type, or medication use (Bullard

et al., 2018). Overall, poor lifestyle and behavioral habits remain a risk factor for Type 2

diabetes, and the prevalence of these behaviors remains a priority in public health

(Hamilton, 2014).

     The MyPlate nutrition plan illustrates the five food groups suggested as the

building blocks for a healthy diet. As Figure 1 illustrates, the MyPlate plan uses the

image of a place setting for a meal and prompts meal planning and food selection before

consumption (Novas, 2019). In 2011, My Plate was released by the U.S. Department of

Agriculture (USDA) to encourage consumers to build a healthy plate during mealtimes

and to promote the 2010 Dietary Guidelines for Americans (National Center for Health

Research, 2019).

Figure 1

My Plate

Currently, MyPlate is based on the 2015–2020 Dietary Guidelines for Americans, which provides detailed instructions for planning healthy meals and snacks. The recommendations include specialized guidelines, such as (a) half of a plate should be fruits and vegetables, (b) choose skim or 1% milk, (c) 50% of grains should be whole grains, (d) protein sources should vary, (e) reduce added sugars and sodium, and (f) limit foods high in solid fats. These recommendations are based on criteria from the USDA's Healthy Eating Index (HEI) measure of diet quality. The HEI is a 100-point scoring system that measures how well populations adhere to the dietary guidelines for Americans (Malkin-Walshein, 2015). Although these USDA MyPlate recommendations are specific, there are many resources available that provide various versions of the plate method.

The diabetes plate method is a version of MyPlate recommended for healthy eating specific to people with diabetes. According to Hamilton (2015), the diabetes plate method is also a comprehensive guide for planning meals. The main difference between the general MyPlate plan and the diabetes plate is the left side of the plate. While MyPlate recommends half the plate be made up of both fruits and vegetables, the diabetic

plan recommends half the plate should be mostly vegetables (Hughes, 2018). In addition, the diabetes plate method focuses on controlling portion sizes of foods that have the most impact on blood glucose levels: starchy, carbohydrate-containing sources such as breads, pastas, potatoes, and breakfast cereals (Hughes, 2018). The diabetes plate method is focused on eating more nonstarchy vegetables that are high in vitamins and minerals and low in calories and carbohydrates. Recommended nonstarchy vegetables include foods such as broccoli, cabbage, carrots, and salads (CDC, 2019).

In studies of the relationship between Type 2 diabetes and diet in African American women, prevention and treatment of this condition have been directly related to healthy eating practices (ADA, 2018). Eating a variety of carbohydrates, selecting healthy portions of whole fruits and vegetables, and adopting overall healthy eating patterns can help manage or reduce risk of diabetes (ADA, 2018).

African American Women and Nutrition

Culture can play a significant role in the dietary behavioral patterns of African American women. Dietary habits of African American women have been linked to higher prevalence of illness due to a consistent diet that includes *soul food* (highly seasoned food with salt and fat), foods high in fat, and foods low in nutrient content (Robinson et al., 2015). Multiple studies have shown that consumption of added sugars and sugar-sweetened beverages is significantly higher in Black or African American populations than in White populations (Crawford et al., 2015). While various studies have shown that low-fat and high-fiber foods have beneficial effects on prevention of Type 2 diabetes, African American women have consistently shown a lower intake of these foods,

including fruits and vegetables (Hamilton, 2014). Positive associations have been found between meat consumption and diabetes, and African American women have been shown to consume more meat products than women from other racial and ethnic groups (Crawford et al., 2015). Overall, multiple studies have revealed how lifestyle and behavioral risks are associates with diet and African American women.

Hamilton (2014) described a cohort study conducted to examine the relationship and differences in Type 2 diabetes risks among certain ethnic groups. Diet and lifestyle practices of African Americans, Hispanics, Asians, and Whites were all examined. While most adults in the United States fell short of the dietary guidelines based on scores from the HEI, the risks of diabetes were shown to be higher among African Americans and other ethnic groups than among Whites (Hamilton, 2014). In 2015, a systematic review and meta-analysis was conducted to determine the association between diet quality, as assessed by the HEI, and the risk of Type 2 diabetes (Schwingshakl et al., 2018). Findings revealed that high-quality diets were associated with a lower risk of Type 2 diabetes. These diets were also found to be associated with risk reduction with overall mortality (Schwingshakl et al., 2018).

African American Women and Physical Activity

Fewer than half of all women in the United States meet physical activity guidelines (Crawford et al., 2015). According to self-report data in the 2011 version of NHIS, African American women were more likely to be classified as inactive compared to White women (Crawford et al., 2015). Various reasons, including sociocultural barriers, have been linked to inactivity in African American communities. The disparities

in physical activity engagement highlight the need for effective strategies and interventions among this particular population.

Physical activity has been associated with decreased risk of developing Type 2 diabetes (Crawford et al., 2015). Both aerobic and muscle strengthening exercises can improve glycemic control and are protective against diabetes (Crawford et al., 2015). Women who walk approximately 5 hours per week have been found to be 33% less likely to develop Type 2 diabetes than those who did not (Crawford et al., 2015). At least 150 minutes of aerobic physical activity is recommended and 2 days of muscle-strengthening exercises per week (Crawford et al., 2015). Nonetheless, studies have shown that fewer than half of all U.S. women meet the recommendations (Crawford et al., 2015). Specific studies, including the NHANES, NHIS, and Behavioral Risk Factor Surveillance System (BRFSS), show that a higher percentage of White women are reaching the recommendations compared to Black women (Crawford et al., 2015). Both self-reported and accelerometer-derived data were measured. Data from an accelerometer, a device measuring acceleration forces, showed that African American women engaged in most physical activity in 10-minute bouts; White women were more likely to have higher rates of self-reported physical activity, therefore meeting recommended guidelines (Crawford et al., 2015).

Numerous cross-sectional as well as prospective and retrospective studies have found significant association between physical inactivity and Type 2 diabetes (International Journal of Health Science, 2017). Insufficient physical activity is a modifiable risk factor for several of the most common noncommunicable diseases,

including diabetes, heart disease, stroke, and certain cancers (CDC, 2017). There are various ways to engage in physical activity; the American Heart Association recognizes physical activity as engaging in physical activity enough to increase heart rate. These activities can include dancing, running, and fast-paced walking. Dancing can combine the benefits of aerobic and weight-bearing exercise. There are many physical and mental health benefits when dancing, including better heart health, stronger muscles, balance and coordination, stronger bones, and lower risk of chronic disease (CDC, 2019).

The CDC suggests planning for more physical activity and setting fitness goals for heathier movement. The CDC suggests 30 minutes per day, 5 days a week, or a total of 150 minutes of moderate intensity physical activity per week. Moderately intense physical activity can include activities that increase heart rate and make an individual breathe harder, such as a brisk walk (CDC, 2019). For this study, physical activity will be defined as 150 minutes of moderate intense exercise per week.

African American Women and Chronic Disease

Chronic diseases such as hypertension, obesity, cardiovascular disease and diabetes are experienced at a higher level in African Americans than in any other group (CDC, 2017). While cardiovascular disease is a principal cause of death in this population, the racial disparity in hypertension related outcomes has been perceived for many years. According to the American Heart Association (2017), African American women are approximately 30% more likely to die from heart disease, as opposed to other racial-ethnic groups. As many Americans have been affected by the obesity epidemic, African American women have been affected significantly. Obesity is a common chronic

disease recognized by the CDC as a Body Mass Index (BMI) of 30.0 or higher. The BMI is a screening tool describing weight that is higher than what is considered healthy for a given height, as overweight or obesity (CDC, 2017). This chronic disease is often correlated with depleted nutrition and limited exercise.

It has been widely recognized that health behaviors and health outcomes have been deeply influenced by health knowledge. These influences may be shaped by theories including the Health Belief Model and Transtheoretical Theory. These models delineate a persons perceived risks and readiness to change. In multiple studies, researchers have found this population is less compliant or adherent to modifiable behaviors that may help reduce disease burden. According to the American Health Association (2017) few African American women meet the standard guidelines for both diet and physical activity. Identifying these health barriers, including lack of knowledge and awareness can help implement effective programs and resources to lead to better health outcomes.

Definitions

A1C: A mathematical number that gives you a picture of your average blood glucose (blood sugar control for the past 2-3 months.

Blood sugar: Also referred to as blood glucose. A class of carbohydrates with a sweet taste including glucose, fructose, and sucrose (ADA, 2019)

Body mass index (BMI): This is a measure of body fat by dividing an individual's weight by the square of his or her height. An individual with a BMI value of 30 is obesity (National Heart, Lung, and Blood Institute, 2017).

Diabetes: A problem with the body that causes blood glucose (blood sugar) to rise higher than normal. Also called hyperglycemia.

My Plate: MyPlate is a nutrition guideline based on the 2015-2020 Dietary Guidelines for Americans, which provides detailed instructions for planning healthy meals and snacks.

Physical activity: exercise at least 3 times a week, or 150 minutes of moderate-intense physical activity Control Type 2 diabetes: BS <200

Type 2 diabetes: The most common form of diabetes, where the body does not use insulin properly. This is called insulin resistance.

Assumptions

This cross-sectional quantitative study will analyze the secondary data set collected from the NHANES Study 2015-2016. This secondary data set included all specified variables that are specific to this study and are assumed to be reliable and valid. To enhance the validity of this study, the following assumptions were taken into consideration:

The selected Health Belief Model is the best option because it addresses a person's perceived beliefs, including risks and benefits as it relates to diet and physical activity. Various researchers have found that participants had some knowledge of the MyPlate plan, including (a) Have you heard of MyPlate? (b) Have you looked up MyPlate on the internet? (c) Have you tried to follow the plan recommended in MyPlate? This model can help provide an understanding of how the individual may react, and how those beliefs about health and wellness justifies those actions.

One scientific survey tested the awareness of MyPlate using the Healthy Eating Index (HEI) scores derived from 24-hour recall data (Jahns, et al., 2018). A Global Wald test of statistical analysis was performed to test for differences in awareness of MyPlate within sociodemographic groups (Jahns et. al, 2018). The population-ratio method was used to calculate total HEI scores, while Zscores were used to test the differences between those with knowledge and those who negatively responded (Jahns et al., 2018). Results showed HEI scores were higher among those who had heard of MyPlate in 2013-2014 (P < 0.001) compared to those who had not (Jahns et al., 2018).

Scope and Delimitations

This study is based on diet and physical activity and how these modifiable risk factors are associate with Type 2 diabetes risk among African Americans. Data for this study will be extracted from the 2016-2016 NHIS database. African American adult women residing in the United States were considered for study because of the high incidence of Type 2 diabetes risk among the population. This study will be restricted to the use of a cross-sectional study.

Significance, Summary, and Conclusions

Lifestyle modifications such as proper diet and physical activity can reduce risk factors associated with Type 2 diabetes among African American women. Food and nutrition play an essential role in health promotion and the prevention of chronic disease (Hickland, 2018). Selection of healthy food choices have been standardized by Dietary Guidelines for Americans, published by Health and Human Services and the United States Department of Agriculture (Hickland, 2018). Specifically, the MyPlate plan serves

as a science-based foundation for nutrition programs and policies. Likewise, physical activity can also reduce the risk of chronic disease and improve overall general health (CDC, 2017). According to the physical activity guidelines, adults should do at least 150 minutes of moderate-intensity exercise per week (Hickland, 2018). This can include dancing, running, or brisk walking. This can allow for the prevention and reduction of disease, and lead to overall better health (Hickland, 2018).

Given the prevalence of chronic conditions such as type 2 diabetes among African American women, interpreting the relationship between possible predictors, MyPlate diet and physical activity, could prove highly valuable for public health initiatives and future policy development. Although much data has been compiled and research has been conducted among women in the United States, very little has been exclusive to the lifestyle factors of African American women and the association with chronic disease, including type 2 diabetes, in this population. Considering the statistical data that 1 out of 4 African American women over age 55 will be diagnosed with diabetes in their lifetime, it has been documented that various behavioral components can contribute to chronic conditions, ultimately resulting in increased morbidity and mortality (ADA, 2017).

Section 2: Research Design and Data Collection

Introduction

The purpose of this study was to examine the predictors of Type 2 diabetes in African American women, ages 18 and older, living in the United States. The dependent variable in this study was Type 2 diabetes. The independent variables in this study were the MyPlate diet and exercise. In this section, I will discuss the design and rationale for this study. I will also discuss the methodology, target population, and sample size; I used a power analysis to determine a sample size that was appropriate and applicable to the African American female population in the United States

The data were collected through the NHANES, which is a part of the CDC. The NHANES survey explores public health issues, including monitoring risk behaviors and trends related to diet and general health. These survey data also estimate percentages of persons in the United States with selected disease risks in designated subgroups (CDC, 2019). In this section, I will describe the data analysis plan, including the applied statistical tests and procedures I used to analyze the NHANES, test rationale, and discuss how the results were interpreted. Beyond the data analysis plan, in this section I will also detail threats to validity and ethical procedures as defined by the secondary data set NHANES. Other studies such as the NHIS and BRFSS may be reviewed.

Research Design and Rationale

The research design used in this project was a quantitative cross-sectional study. Existing secondary data analysis was used from NHANES to carry out the study. The research variables included the dependent variable (Type 2 diabetes), the independent

variables (MyPlate diet and physical activity), and confounder (age). The unadjusted

odds may have included MyPlate and diabetes, and physical activity and diabetes. Once

adjusted, all different variables were considered regarding their effects and association.

The rationale for using this cross-sectional approach was for reliability of statistical

relationships. Additionally, the findings of this research will help fill a research gap and

allow for comparison and correlation of specific groups within this population. For

example, data on demographic factors including gender and race/ethnicity were collected

at the same time as data on the dependent variables (diet and physical activity).

Methodology

The methodology section will include a review of how the study was carried out.

Included are a description of the population, sampling and sampling procedures used to

collect data in secondary data materials, secondary data management processes,

instrumentation and operationalization of constructs, ethical procedures, and threats to

validity.

Population

The target population of this study was noninstitutionalized civilian residents

living in the United States. The survey examines a nationally representative sample of

about 5,000 people each year, who are interviewed in their homes and complete the

health examination element of the survey. A sample from 2015–2016 was used. The

NHANES now samples a larger number of subgroups, including non-Hispanic Blacks,

which were oversampled for accurate estimates of health status indicators (CDC, 2019).

The NHANES is a national survey designed to monitor a broad range of health topics

(CDC, 2018). These survey results are key in delivering data to track healthcare access, healthcare status, and progression toward achieving national health objectives. Data were obtained and collected through personal household interviews.

Sampling and Sampling Procedures

A multistage probability design was used in NHANES 2015–2016. To sample larger numbers of particular subgroups, the NHANES design may change periodically. In 2011, a primary sample design was changed to sample non-Hispanic Asians. This group would be included with the ongoing oversampling of other populations, including Hispanics, non-Hispanic Blacks, and low-income Whites (CDC, 2019). Of the populations residing in the 50 states and Washington, D.C., sample selection included counties or small groups of counties also called primary sampling units (CDC, 2019). In addition, blocks, or groups of blocks, holding a cluster of households, households within segments, and individuals within a household were used in sample selection. In the 2015–2016 survey, 15,327 people were selected in over 30 locations (CDC, 2019). Of the selected participants, 9,544 were examined and 9,971 completed the interview.

NHANES data files are of public use and can be selected by using common variable names or participant identification numbers (CDC, 2019). However, certain data sets are not released to the public, including some data regarding pregnant women. Access to this information is only granted through an onsite, secure network, NCHS's Research Data Center, to guarantee confidentiality of survey participants (CDC, 2019). Health examinations are conducted in a mobile education center, a standardized environment where high quality data collection occurs.

In this research, I used a quantitative cross-sectional design. The sample was comprised of African American women ages 18 and over in the United States. A representative sample from the NHANES data from 2015–2016 was used to test the association between independent variables *nutrition* (MyPlate) and *physical activity* and dependent variable *Type 2 diabetes*. A power analysis was conducted to determine probability of whether the MyPlate diet and physical activity influence Type 2 diabetes risk.

The total sample size for this analysis was 395. A G*Power analysis was used to determine the probability of diabetes among African American women who have been physically active and who have tried the MyPlate diet. To compute and justify for logistic regression, various assumptions or some knowledge of the model was required. A single predictor will calculate for the logistic regression analysis. In this particular study, an a priori power analysis was conducted using a two-tailed z test for logistic regression.

Pr $(Y = 1 \mid H = 1)$ H 1 = 0.18, Pr $(Y = 1 \mid H = 1)$ H0 = 0.06, and alpha err probability of 0.05. Selected power $(1 - B \text{ err prob}) = 0.95$ and R2 other than X = 0.04 because these covariates are expected to have a low association with diabetes. The X distribution is binomial, and X parm π 0.45 because the number of cases where individuals tried the MyPlate diet was expected to be less than half. As this is a current representation, the entire sample size was used. Overall, a binomial (dichotomous) study was used for independent variables MyPlate diet and physical activity. In this research, I sought to determine if individuals used the MyPlate plan or not and if they were

physically active or not. Also, I sought to determine for the dependent variable if the individuals were Type 2 diabetic or not.

Instrumentation and Operationalization of Constructs

NHANES 2015–2016 used a sample person questionnaire instrument to collect individual-level information on participants related to diet behavior and nutrition and diabetes. For example, the use and awareness of MyPlate are assessed in the Dietary Behavior and Nutrition questionnaire. The three pertinent questions were: Have you heard of MyPlate? Have you looked up MyPlate on the internet? And have you tried to follow the recommendations in MyPlate? These questions were administered during the home interview.

The NHANES data and this questionnaire instrument were appropriate to this current study because of the survey's long history of assessing health and nutritional status of adults in the United States. NHANES data files are public use, so no access requirements or additional permission was needed to obtain NHANES information.

The validity of a measure indicates whether that measure actually captures the phenomenon intended. For example, one NHANES study tested the independent samples t-test comparing total average HEI scores between those who have heard of MyPlate and those who have not heard of MyPlate, those who have heard of MyPlate (n = 964) had a mean HEI total score of M = 55.97, while those who have not heard of MyPlate (n = 4,711) had a mean HEI total score of M = 52.97, (t = 6.38, p < .000). Therefore, there was a significant difference in mean total HEI score between those who have heard of MyPlate and those who have not heard of MyPlate. In contrast, the reliability of a

measure indicates whether the same answer would be specific to the measure if requested again.

Table 1 shows specific variable types and categories. A categorical variable, equivalently known as a nominal variable, incorporates two or more categories with no intrinsic order (Mann, 2018). Type 2 diabetes, MyPlate, and physical activity are considered both categorical and nominal for this study. Age is a continuous variable because it is numeric and can include an infinite number of values. Type 2 diabetes is the dependent variable, as its outcomes can be dependent upon the manipulation or alteration of the independent variables, MyPlate and physical activity. Age is a confounder as it influences both the dependent and independent variable, while also being used to examine potential cause and effect of the relationship between the variables.

Table 1

Frequency Table for Diabetes Diagnosis

Variable	Type	Role	Category
Type 2 diabetes	Categorical	Dependent variable	Nominal
MyPlate	Categorical	Independent variable	Nominal
Physical activity	Categorical	Independent variable	Nominal
Age	Continuous	Confounder	Continuous

MyPlate is a diet plan that uses an image of a plate separated into four color-coded sections labeled (a) fruits, (b) vegetables, (c) proteins, and (d) grains, with an additional section labeled dairy. This image and the associated plan is used as an educational tool to encourage eating a healthy and balanced diet (USDA, n.d.c.). There is also a MyPlate plan that incorporates a daily checklist, showing targets for various food groups, depending on the height and weight of the individual (USDA, n.d.c.). The

variables are measured or manipulated by a three-part questionnaire, as previously

mentioned. For each of these questions, participants have the option of choosing *yes*, *no*,

don't know, or they can refuse to respond to the question (CDC, 2013a).

Physical activity is described as moderate intense exercise at least 150 minutes a

week. The definition of physical activity levels from the NHANES data were used in this

study. The number of minutes per day engaged in physical activity was used to measure

moderate recreational activity and moderate work activity. For significant health benefits,

the 2015 Physical Activity Guidelines for Americans recommends that adults engage in

at least 150 minutes of moderate intensity physical activity per week. Fewer than 150

minutes of physical activity per week was considered not meeting Physical Activity

Guidelines for Americans. Physical activity was assessed by participants' self-reported

and actual time spent engaging in physical activity. Participants' response to whether

they engage in moderate intense physical activity was used to categorize those who

engaged in physical activity.

Data Analysis Plan

IBM's SPSS Version 25 was used to import NHANES data for management and

analysis. First, the data set was fragmented to include only African American women

ages 18 and above. G*Power 3.1 statistical software was used to run a power analysis and

compute the required sample size for this study. Software used for this analysis came

from Faul et al. (2007). G*Power 3 is a flexible statistical power analysis program for the

social, behavioral, and biomedical sciences. The research questions are reiterated below,

and the specific analytical strategy explained after.

RQ1: Is the overall prevalence of Type 2 diabetes in African American women in the NHANES survey comparable to that of African American women nationwide?

H01: The overall prevalence of Type 2 diabetes in African American women in the NHANES survey is not comparable to that of African American women nationwide.

H11: The overall prevalence of Type 2 diabetes in African American women in the NHANES survey is comparable to that of African American women nationwide.

RQ2: Is the MyPlate diet associated with the occurrence of Type 2 diabetes in African American women in the U.S.?

H01: The MyPlate diet is not associated with the occurrence of Type 2 diabetes in African American women in the U.S.

H11: The MyPlate diet is associated with the occurrence of Type 2 diabetes in African American women in the U.S.

RQ3: Is physical activity associated with the occurrence of Type 2 diabetes among African American women

H01: Physical activity is not associated with the occurrence of Type 2 diabetes among African American women in the U.S.

H11: Physical activity is associated with the occurrence of Type 2 diabetes among African American women in the U.S.

The 2015–2016 NHANES data sets were used for this study. The G*Power 3.1 analysis was used to test the hypotheses. The dependent variable was Type 2 diabetes

status (nominal). The independent variables were the MyPlate diet (nominal) and physical activity (nominal). The confounder that was adjusted for was age. A standardized questionnaire was used to determine results. The statistical approaches for these RQs include comparison of percentages for RQ1 and logistic regression for RQ2 and RQ3. Logistic regression was used for data analysis to determine the odds (ratio) of African American women being Type 2 diabetic, with the MyPlate diet and physical activity as the predictors of interest.

Descriptive statistics were used to describe the sample characteristics. Frequencies and percentages were reported for categorical data (i.e., age, socioeconomic status, diabetes, MyPlate diet, and physical activity). Means and standard deviations were reported for interval variables. I plan to assess confounding variables such as age or socioeconomic status. Confounders are variables that are not specifically imperative but that may influence the association of both the dependent variable (Type 2 diabetes) and the independent variables (MyPlate diet and physical activity).

Statistical methods may be used to control confounders related to the primary relationships between exposure and outcomes. I report both unadjusted and adjusted odds ratios as needed. Any data conventions were implemented in a copy of working file. Specifically, a z-test, logistical regression model was performed to predict the odds of diabetes outcomes given the independent variables (MyPlate and physical activity). A logistic regression was used when the outcome measure was dichotomous. The odds ratio was the point estimate assessed given the independent variables. An analysis was conducted of the entire data set, specifically for African American women in this model.

Threats to Validity

Although data sets for this study are frequently evaluated, there are still threats to validity. This may include confounding as well as extraneous variables. Extraneous variables may challenge the independent variable as it relates to outcomes, while confounding variables may influence the dependent variable. Researchers consider these threats when making assumptions about association. To address concerns, specificity of variables were reviewed, ensuring a representative sample generalized the outcome (Koh, 2009).

Ethical Procedures

The dietary component of NHANES is a partnership between the USDHHS and the USDA. Specifically, under this partnership, the NHANES survey is responsible for the survey sample design and all aspects of the data collection. All participants of NHANES are eligible for the dietary interview, as it relates to total nutrient intake. The NHANES had direct connections with specific participants in several regions to complete the nutrition and physical activity exam and survey. Additionally, utilizing various amounts of data through this approach ensures privacy of study participants and limits ethical issues (Graham, 2018). The CDC abides by regulations that sensitive information such as name, address, or contact information will not be made publicly available, and public use data will be used for this study.

Obtaining IRB approval was easily attainable as this survey is for public use. Additionally, it is freely accessible and often acceptable for research without the need for IRB approval. The use of secondary data allows for quick execution and access of

information, while avoiding duplication (Graham, 2018). To increase the reliability and

precision of data, the NHANES design has periodically changed over the years to sample

larger numbers of certain subgroups (CDC, 2019).

Summary

The purpose of this study is to understand the relationship between independent

variables MyPlate diet and physical activity, to dependent variable Type 2 diabetes, in

African American women. Data was derived from the 2015-2016 NHANES Survey. A

quantitative cross-sectional study was used in the target population of African American

women, age 18 and older in the United States. Ethical procedures as well as threats to

validity will be addressed. Specific data and variables were reviewed as they related to

risk factors for diabetes. Study results will be discussed and revealed in the next chapter.

Section 3: Presentation of the Results and Findings

Introduction

The purpose of this quantitative study was to examine predictors of Type 2 diabetes, including lifestyle factors (diet and exercise), in African American women ages 18 and over in the United States. With this research, I sought to fill a gap in the literature regarding the association between the MyPlate diet and physical activity and Type 2 diabetes among African American women in the United States. Current U.S. statistics show a disproportionately higher burden of chronic disease in non-White racial groups, with increasing complex influences due to unique lifestyle and behavioral factors (Chan, 2017). Prior researchers have found that in the United States, compared with Caucasians, minority groups are at greater risk for both Type 2 diabetes and obesity (Richardson, 2015). In this section, I will present the results of the analysis using IBM SPSS Version 25. I describe characteristics of the sample and results of the hypothesis testing.

Data Collection of Secondary Data Set

To ensure the health status of the target population and the sample selected were reliable and precise, I used data from the NHANES study and a complex, multistage probability design with a large sample size (CDC, 2015). A representative sample from the NHANES data from 2015–2016 was used to test the association between independent variables nutrition (MyPlate) and physical activity (150 minutes of moderate intense exercise) and the dependent variable Type 2 diabetes. The sample was comprised of African American women ages 18 and over in the United States. I conducted a power

analysis for the study to determine probability of whether the MyPlate diet and physical activity would influence Type 2 diabetes risk.

A downloadable public use data file was accessed through the CDC's file server, which encompasses questionnaires, data sets, and various documentation from surveys and data collection systems. The data for this cross-sectional study were obtained from the 2015–2016 NHANES survey, using a sample population of civilian, noninstitutionalized residents of the United States. This included an ongoing oversampling of populations including Hispanics, non-Hispanic Blacks, and low-income Whites (CDC, 2019). A selected order for NHANES included: (a) primary sampling unit selections that include small groups of contiguous counties, (b) selection of divisions within primary sampling units that compose a block or classification of blocks containing a collection of households, (c) election of distinct households within segments, and (d) election of individuals within a household.

The variables of interest were Type 2 diabetes as the dependent variable and MyPlate diet and physical activity as the two independent variables, while confounding for age. This survey is conducted to examine a nationally representative sample of about 5,000 people each year; participants are interviewed in their homes and complete the health examination element of the survey. In the NHANES 2015–2016 survey, 15,327 people were selected in over 30 different locations (CDC, 2019). Of those selected, 9,544 were examined and 9,971 completed the interview. The data set was exactly as expected; therefore, analyses were conducted as previously described.

A G*Power analysis was used to determine the probability of diabetes among African American women who have tried the MyPlate diet and been physically active. A random sample size for this analysis was calculated at 395. A single predictor will calculate for the logistic regression analysis. In order to justify, various assumptions or some knowledge of the model is required. In this particular study, an a priori power analysis was conducted using a two-tailed z test for logistic regression. Because the covariates are expected to have a low association with diabetes, the X distribution was binomial. Additionally, the number of cases in which individuals tried the MyPlate diet was also expected to be low or less than half. Overall, independent and dependent variables were dichotomous. Specifically, I sought to determine for the dependent variable if the individuals were Type 2 diabetic or not, if individuals used the MyPlate plan or not, and if they were physically active or not.

Results

To address the research questions, I conducted a series of binary logistic regressions with the dependent variable Type 2 diabetes and MyPlate and physical activity as the independent variables. SPSS sample procedures were used for performance analysis.

Research Question 1: Is the overall prevalence of Type 2 diabetes in African American women in the NHANES survey comparable to that of African American women nationwide?

H01: The overall prevalence of Type 2 diabetes in African American women in

the NHANES survey is not comparable to that of African American women

nationwide.

H11: The overall prevalence of Type 2 diabetes in African American women in

the NHANES survey is comparable to that of African American women

nationwide.

To answer RQ1, a set of uniquely qualified participant identification numbers

were used, and the NHANES interview data files were merged to include only those

observations with specific criteria. A valid sample of approximately 9,571 participants

responded *yes*, *no*, or *borderline* that they had been told by a doctor they have diabetes.

According to the American Diabetes Association, approximately 11.7% of

African Americans/non-Hispanic Blacks are diagnosed with diabetes, compared to 10.4%

found in my sample. Borderline results were not included. Without including borderline

diabetics, my sample had a lower prevalence of diabetes than the general population.

When I included borderline, the percentage was comparable to the general population.

Table 2 shows the number of participants who received a diagnosis or were told by a

doctor they had diabetes. Additionally, Table 2 represents the frequency and number of

individuals who were told yes, they had diabetes, no, they did not have diabetes, or they

were borderline, meaning prediabetic. Prediabetes is when a person's blood sugar levels

are higher than normal, but not high enough to be diagnosed with diabetes (ADA, 2017).

Table 2

Frequency Table Showing Participants' Diabetes Diagnoses

		Frequency	Valid percent
Valid	Yes	856	8.9
	No	8,568	89.5
	Borderline	147	1.5
Total		9,575	

To answer RQ2, I conducted a binary nominal logistic regression. The dependent variable was Type 2 diabetes and the independent variable was the MyPlate diet.

RQ2: Is the MyPlate diet associated with the risk of Type 2 diabetes in African American women in the U.S.?

H01: The MyPlate diet is not associated with the risk of Type 2 diabetes in African American women in the U.S.

H11: The MyPlate diet is associated with the risk of Type 2 diabetes in African American women in the U.S.

A total sample of 1,245 participants responded to whether they had tried the MyPlate plan. A bivariate logistic regression analysis was conducted to determine if trying MyPlate is a predictor of Type 2 diabetes. This statistical analysis was conducted to examine the relationship between the dependent and independent variables and to estimate the likelihood of diabetes as an outcome. Table 3 shows those who tried MyPlate and have diabetes and those who tried MyPlate and do not have diabetes. The table also shows those who did not try MyPlate and have diabetes and those who did not try MyPlate and do not have diabetes. The diabetes data were recoded to include 1 = *yes* and 2 = *no*. I did not exclude borderline diabetes diagnoses but decided to include it with

the nondiabetics. With borderline diabetes, blood sugar levels are higher than normal but are not high enough to be considered a sign of diabetes. After running the logistic regression, the outcomes were within the same range of the odds ratio and comparable to the general population.

As Table 3 illustrates, there was a significant amount of missing data; those values were not included in this analysis. A smaller number of approximately 128 confirmed cases were used in which participants had answered whether they had tried MyPlate or had been diagnosed with diabetes. Data for the *don't know* response was excluded. The data show that out of 128 cases, 49 answered *yes*, they had tried the MyPlate diet, and 79 answered *no*, they had not tried the MyPlate diet. In the same manner, 13 answered yes they were diagnosed with diabetes, while 115 answered they had not been diagnosed with diabetes. Data show that more people had not tried the MyPlate than those who had, and more people were not diagnosed with diabetes in this analysis than those who were.

Table 3

MyPlate and Diabetes Contingency

		Tried MyPlate		Total
		Yes	No	
Diabetes	Yes	5 (38.5%)	8 (61.5%)	13
	No	44 (38.3%)	71 (61.7%)	115
Total		49	79	128

Note. Crosstab showing frequency of participants who tried MyPlate diet and diagnosis of diabetes.

Table 4 displays a binary logistic regression showing the association between MyPlate and a diagnosis of diabetes among the entire population of participants in the

NHANES 2015–2016 data set. Out of a total of 1,191 participants who tried the MyPlate

diet, the unadjusted odds ratio is 0.946. The result of this analysis was not statistically

significant at p > .05, and there is no association.

Table 4

Binary Logistic Regression (Unadjusted) for MyPlate and Diabetes

	B	SE	Wald	df	Sig.	Odds Ratio	95% C.I. Lower	Upper
MyPlate diet (1)	–.056	.207	.073	1	.787	.946	.631	1.418
Constant	–2.240	.164	185.868	1	.000	.106		

Note. Binary logistic regression showing the unadjusted association between MyPlate and

a diagnosis of diabetes among the entire population of participants in the NHANES

2015–2016 data set. N = 1,191

　　　　Table 5 displays a binary logistic regression showing the association between

MyPlate and a diagnosis of diabetes among the entire population of participants in the

NHANES 2015–2016 data set, while controlling for age. Out of a total of 1,191

participants who tried the MyPlate diet, the adjusted odds ratio is 0.946. The result of this

analysis was not statistically significant, at p > .05, and there is no association.

Table 5

Binary Logistic Regression (Adjusted) for MyPlate and Diabetes

	B	SE	Wald	df	Sig.	Odds ratio	95% C.I. Lower	Upper
MyPlateDiet(1)	.055	.207	.071	1	.790	.946	.631	1.419
Age at screening (in years)	.004	.004	1.066	1	.302	1.004	.996	1.012
Constant	–2.374	.212	125.093	1	.000	.093		

Note. Binary logistic regression showing the age-adjusted association between MyPlate and a diagnosis of diabetes among the entire population of participants in the NHANES 2015–2016 data set. N = 1,191

Table 6 displays a binary logistic regression showing the association between MyPlate and a diagnosis of diabetes among NHANES 2015–2016 study participants who are African American women. Out of a total of 446 African American women participants who tried the MyPlate diet, the unadjusted odds ratio is 0.705. The result of this analysis was not statistically significant, at p > .05, and there is no association.

Table 6

Binary Logistic Regression (Unadjusted) for MyPlate and Diabetes in African American Women

	B	SE	Wald	df	Sig.	Odds ratio	95% C.I. for EXP(B) Lower	Upper
MyPlate diet (1)	–.350	.450	.605	1	.437	.705	.292	1.702
Constant	–2.128	.335	40.475	1	.000	.119		

Note. Binary logistic regression showing the unadjusted association between MyPlate and a diagnosis of diabetes among NHANES 2015–2016 study participants in the data set who are African American women. *n* = 446

Table 7 displays a binary logistic regression showing the association between MyPlate and a diagnosis of diabetes among NHANES 2015-2016 study participants who are African American Women, while controlling for age. Out of a total of 446 African American women participants who tried the MyPlate diet the adjusted odds ratio is 0.706. The result of this analysis was not statistically significant, since p > .05, and there is no association.

Table 7

Binary Logistic Regression (Adjusted) for MyPlate and Diabetes in African American Women

| | B | SE | Wald | df | Sig. | Odds ratio | 95% C.I. for EXP(B) | |
							Lower	Upper
MyPlate diet (1)	−.348	.450	.597	1	.440	.706	.292	1.707
Age at screening (in years)	.001	.009	.005	1	.944	1.001	.983	1.019
Constant	−2.151	.465	21.378	1	.000	.116		

Note. Binary logistic regression showing the age-adjusted association between MyPlate and a diagnosis of diabetes among African American women participants in the 2015–2016 NHANES data set. $n = 446$

Overall, the result of the analysis were not statistically significant, since p > .05, and there is no association. The unadjusted odds ratio showing the association between MyPlate and a diagnosis of diabetes among the entire population of participants in the NHANES 2015-2016 data set is 0.946 and the adjusted odds ratio, controlling for age, is the same at 0.946.

Similarly, the unadjusted odds ratio showing the association between MyPlate and a diagnosis of diabetes among NHANES 2015-2016 study participants in the data set who are African American women is .705 and the adjusted odds ratio, controlling for age is .706. This concludes that age is not a significant criterion in my analysis, and there is no association between MyPlate diet and African American women in the United States. Therefore, I reject the alternative hypothesis and retain the null, meaning that there is no

association between Type 2 diabetes and the MyPlate diet in African American women in the United States.

I used a binary logistic regression in answering my research questions, as revealed in Tables 4-7. Binary logistic regression was the statistical model of choice because it is suitable for predicting the odds of a case, based on the value of the independent variable. It is also useful for analyzing multiple factors influencing both positive and negative outcomes. The binary logistic regression analysis aligned well with my research for testing the association between the predictor variables (MyPlate and physical activity) and the outcome variable (Type 2 diabetes), while adjusting for the confounder (age).

To approach Research Question 3: "Is physical activity associated with the risk of Type 2 diabetes in African American women in the U.S?", a binary logistic regression was conducted. The dependent variable was Type 2 Diabetes, and the independent variable was physical activity.

RQ3: Is physical activity associated with the risk of Type 2 diabetes among African American women

H01: Physical activity is not associated with the risk of Type 2 diabetes among African American women in the U.S.

H11: Physical activity is associated with the risk of Type 2 diabetes among African American women in the U.S.

A valid sample of 6,963 participants responded to the question of participated in moderate physical activities as "yes", "no", or "don't know". Table 8 contingency table reveals those who exercise and have Diabetes versus those who exercise and don't have

Diabetes. This table also displays data regarding those who did not exercise and have

Diabetes, as opposed to those who did not exercise and don't have Diabetes. The data

was recoded data to include only 1 -yes, and 2 - no, and "don't know" was excluded. All

other values were defined as system missing.

Table 8 displays a contingency table showing frequency of participants who

participated in moderate physical activity and who had a diagnosis of Diabetes. Out of a

total of 751 participants, 60 were diabetic, and 691 were not. In the same manner, 417

were physically active, while 334 were not. The result of this analysis was not

statistically significant, since $p > .05$, and there is no association.

Table 8

Physical Activity and Diabetes Contingency Table

Diabetes		Physical Activity		
		Yes	No	Total
	Yes	37 (61.7%)	23 (38.3%)	60
	No	380 (55%)	311(45%)	691
Total		417	334	751

Note. Crosstab showing frequency of participants who participated in moderate physical

activity and who had a diagnosis of diabetes. COR = 1.32, 95% CI = 0.77 - 2.26, p-value

= 0.16

Table 9 displays a binary logistic regression showing the association between

moderate physical activity and a diagnosis of diabetes among the entire population of

participants in the 2015-2016 NHANES data set. Out of a total of 6,963 participants who

were moderately active, the unadjusted odds ratio is 1.075. The result of this analysis was

not statistically significant, since $p > .05$, and there is no association.

Table 9

Physical Activity and Diabetes (Unadjusted)

	B	SE	Wald	df	Sig.	Odds ratio	95% C.I. for EXP(B)	
							Lower	Upper
Exercise(1)	.073	.108	.455	1	.500	1.075	.871	1.328
Constant	–2.304	.083	777.392	1	.000	.100		

Note. Binary logistic regression showing the association between moderate physical activity and a diagnosis of diabetes among the entire population of participants in the 2015–2016 NHANES data set. N = 6,963

Table 10 displays a binary logistic regression showing the association between moderate physical activity and a diagnosis of diabetes among the entire population of participants in the 2015-2016 NHANES data set, controlling for age. Out of a total of 6,963 participants who were moderately active, the adjusted odds ratio is 1.032. The result of this analysis was not statistically significant, since p > .05, and there is no association.

Table 10

Physical Activity and Diabetes (Adjusted)

	B	SE	Wald	df	Sig.	Odds ratio	95% C.I. for EXP(B)	
							Lower	Upper
Age at screening (in years)	.006	.004	2.927	1	.087	1.006	.999	1.014
Exercise (1)	.031	.188	.028	1	.868	1.032	.714	1.491
Constant	–2.613	.190	188.939	1	.000	.073		

Note. Binary logistic regression showing the association between moderate physical activity and a diagnosis of diabetes among the entire population of participants in the 2015–2016 NHANES data set, controlling for age. N = 6,963

Table 11 displays a binary logistic regression showing the association between moderate physical activity and a diagnosis of diabetes among the entire population of participants in the 2015-2016 NHANES data set, who are African American women. Out of a total of 1,265, the unadjusted odds ratio is 1.041. The result of this analysis was not statistically significant, since p > .05, and there is no association.

Table 11

Binary Logistic Regression (Unadjusted) for MyPlate and Diabetes in African American Women

	B	SE	Wald	df	Sig.	Odds ratio	95% C.I. for EXP(B)	
							Lower	Upper
Exercise (1)	.040	.188	.046	1	.829	1.041	.721	1.504
Constant	–2.404	.141	291.646	1	.000	.090		

Note. Binary logistic regression showing the association between moderate physical activity and a diagnosis of diabetes among 2015–2016 NHANES participants in the data set who are African American women. $n = 1,265$

Overall, the result of this analysis was not statistically significant, since p > .05 and there is no association. The unadjusted odds ratio showing the association between moderate physical activity and a diagnosis of diabetes among the entire population of participants in the 2015-2016 NHANES data set is 1.075 and the adjusted odds ratio, controlling for age, did not significantly change at 1.032.

Finally, the binary logistic regression analysis showing the association between moderate physical activity and a diagnosis of diabetes among 2015-2016 NHANES participants in the data set who are African American Women, was similarly significant at 1.041. Therefore, I reject the alternative hypothesis and retain the null, meaning that

there is no association between Type 2 diabetes and physical activity in African

American women in the United States

Table 12 displays the Final Adjusted model showing the association between

MyPlate, moderate physical activity and a diagnosis of diabetes among 2015-2016

NHANES participants in the data set who are African American Women. The result of

this analysis was not statistically significant, since $p > .05$ and there is no association.

Therefore, I reject the alternative hypothesis and retain the null, meaning that there is no

association between Type 2 diabetes and physical activity in African American women in

the United States

Table 12

Final (Adjusted) Logistic Regression for MyPlate, Physical Activity, and Diabetes

	B	SE	Wald	df	Sig.	Odds ratio	95% C.I. for EXP(B)	
							Lower	Upper
Exercise	.492	.686	.514	1	.473	1.636	.426	6.277
Age at screening (in years)	.003	.014	.040	1	.841	1.003	.975	1.031
Tried MyPlate plan	−.074	.692	.012	1	.914	.928	.239	3.603
Constant	− 2.336	1.258	3.447	1	.063	.097		

Note. Final adjusted model showing the association between MyPlate, moderate physical

activity, and a diagnosis of diabetes among 2015–2016 NHANES participants in the data

set who are African American women.

Summary

From the results of the data analysis, with a 95% confidence interval and $p < 0.05$,

it is noted that there is no association between the MyPlate diet and Type 2 diabetes in

African American women. In this case, the null hypotheses were not rejected. In the same

manner, the results of the next data analysis showed there is no association between

physical activity and Type 2 diabetes in this particular population. In this case, again, the

null hypothesis was not rejected. Age was initially included as it was considered to be an

important variable, however, the overall analysis showed that the odds ratio did not

change significantly when adjusted for age; therefore, age would not be considered a

significant confounder.

      Overall, there was insufficient evidence to indicate whether there was a statistical

significance or not between these variables, and to determine if the prevalence is

comparable to that of the national average. Section 4 describes the summary of the

findings, interpretation of the findings, theoretical application, limitations,

recommendations as it relates to future research, and implications for professional

practice and social change.

Section 4: Application to Professional Practice and Implications for Social Change

Introduction

The purpose of this research was to examine the relationship between Type 2 diabetes, the MyPlate diet, and physical activity among African American women in the United States In this section, I interpret the research findings, discuss the study limitations, and investigate recommendations for further research. Data were from the 2015–2016 NHANES data set. Descriptive data analysis of the final data set was performed using SPSS 25. Overall, the study revealed no association between the dependent variable Type 2 diabetes and the independent variables, MyPlate and physical activity.

Interpretation of Findings

For RQ1, the findings confirm the alternative hypothesis and extend knowledge in the discipline of diabetes in the African American community. The results indicate that the prevalence of Type 2 diabetes in African American women is comparable to that of African American women nationwide. Upon comparing percentages, data showed that approximately 10.4% of non-Hispanic Black women are diagnosed with Type 2 diabetes, compared to the ADA's 11.7%. These percentages are in close proximity; therefore, the alternative hypothesis was accepted, and the null hypothesis was rejected for RQ1. The overall prevalence of Type 2 diabetes is comparable to that of African American women nationwide. The remaining results work to confirm the null hypothesis and continue to extend knowledge in the discipline of diabetes in this particular population.

RQ2, asked Is the MyPlate diet associated with the risk of Type 2 diabetes in African American women in the United States? The results indicate no association between Type 2 diabetes and the MyPlate diet among African American women in the United States. The results of the analysis were not statistically significant. The alternative hypothesis was rejected, and the null hypothesis for RQ2 was accepted.

In comparison to what has been found in peer reviewed literature, there is not enough evidence to prove an association between diabetes and the MyPlate diet in African American women. Various peer-reviewed studies have been conducted that examine the relationship between diabetes and diet. For example, in an NIH (2018) study, patterns from two different diets were identified. One was considered a healthy pattern, which included fish, low-fat dairy products, fruits, and vegetables, and the other was considered a Western pattern that included a high intake of red meat, processed meat, and refined grains. Results determined that a healthy diet pattern was inversely associated with risk of Type 2 diabetes; the Western diet showed a significant association with increased risk of Type 2 diabetes (NIH, 2018).

In my particular study, the MyPlate diet encompasses a combination of foods with several different components, including carbohydrates, fruits and vegetables, and meats or proteins. Although limited evidence was available, the *Journal of Nutrition Education and Behavior* (2021) indicated that those who did try the MyPlate diet fell below the recommended minimum serving amounts for all subjects for grains (76%), vegetables (33%), fruits (24%), and dairy (13%), but exceeded minimum recommended servings of protein. Overall, according to the results, no association was found between the MyPlate

diet and occurrence of diabetes among African American women because there was insufficient evidence to prove it.

Based on the findings, no association was observed likely because few people in the study population had heard about or tried the MyPlate diet. In the same manner, no association was found between the MyPlate diet and the overall population. MyPlate was intended to be a current educational tool and nutritional guide by the USDA and replaced the MyPyramid in 2011. As guidelines continue to change, there may have been limited time for adoption of the guidelines and data to be analyzed.

Drawing from these observations, adopting the MyPlate diet may not be effective. RQ3 asked, Is physical activity associated with the risk of Type 2 diabetes in African American women in the United States? The results indicated no association between physical activity and Type 2 diabetes among African American women in the United States. The results of the analysis were not statistically significant. Therefore, the alternative hypothesis was rejected, and the null hypothesis for RQ3 was retained.

In the same manner, there has not been enough evidence to prove an association between diabetes and physical activity in my study for African American women. In various peer-reviewed studies, researchers have examined the relationship between diabetes and physical activity. These physical activity guidelines were set by the USDHHS at 150 minutes of moderate intense exercise per week. Researchers have reviewed the relationship between women from various ethnic backgrounds and physical activity (NIH, 2018). Researchers found that fewer than half of all women in the United States met the physical activity guidelines. More specifically, Black or African American

women were more likely to be classified as inactive than women from other racial and

ethnic groups. (NIH,2018).

In my particular study, physical activity requirements matched the standard

guidelines of 150 minute per week. However, according to the data results, there was no

association between physical activity and African American women, or there was

insufficient evidence. This is one of the main reasons I believe an association was not

observed. As the overall population did not meet standard guideline of 150 minutes per

week, the African American population did not meet those guidelines as well. In my

observations, this could be due to social determinants of health, including economic,

education, and access to quality care. As the Health Belief Model indicates, personal

beliefs, disease perception, and health behaviors can influence a person's perception on

how physical activity influences health. If this population lacks access, education, or

affordability to physical activity resources, their time being physically active and meeting

the recommended guidelines may be limited. An association cannot be observed when

the majority of participants fall beneath the recommendations. Essentially, there was no

association found in the overall population, and in the same manner, no association was

found in the African American population.

Theoretical Applications

As a significant number of African American women are borderline, prediabetic,

or undiagnosed, a major predictor of health outcomes has been health education status.

Knowledge of one's individual health status, in theory, leads to better health outcomes.

Individuals' attitudes and beliefs can have a strong effect on behavioral patterns in

general and from a nutritional perspective, such how or if they use the MyPlate diet. Although there is limited information on the MyPlate diet, some studies have shown that consuming food groups represented in MyPlate is key to improving health disparities (Novas, 2019). However, some researchers have also described how dietary guidelines can be culturally challenging (Robinson et al., 2015).

As the MyPlate plan is a guideline intended for Americans to eat and be heathier, my study shows no association between African American women and the plan. This leads me to further explore the design and study of the MyPlate plan, including what populations it tends to target. After numerous studies have been fulfilled, a persisting concern that may still arise would be if this plan was intended for all Americans or just a particular group or population. Determining if the MyPlate plan works is difficult because there are so many different nutrients involved. In my research, I found that many studies were conducted to analyze individual contributing food groups and not the MyPlate plan as a whole.

In most studies, researchers do not look at the plan as a whole. For example, a NIH study was conducted in which researchers analyzed dairy consumption in African Americans and found that dairy products may support a reduced risk of diabetes (Hickland, 2018). Another study was conducted to analyze the fruits and vegetables category. Consuming a variety of fruits and vegetables has been shown to help protect against chronic diseases, including Type 2 diabetes. (CDC, 2018). These may be individual contributors but few studies compare the MyPlate as a whole. However, in comparison to my study, there is no association found.

As the CDC recommends at least 30 minutes of weekly physical activity (CDC, 2017), studies have shown that not only African Americans, but the American population in general falls below the recommend guidelines for exercise. More than 15 percent of the American population is physically inactive (CDC, 2017). The CDC states a lack of physical activity as one of the leading preventable risk factors for Type 2 diabetes (CDC, 2017). From a cultural perspective, one major contributor to lack of physical activity is time. Busy work, family, and personal schedules have been the basis of limited exercise in various populations, including the African American community. Another reason African Americans lack proper exercise is the environment. Many Americans live in communities that are not designed for physical activity, including lack of sidewalks, parks, and walking trails, which in turn, contributes to limited activity.

Although physical activity guidelines are intended for Americans to be healthy, my study is showing no association between physical activity and Type 2 diabetes in African American women. In comparison to much of the research that has been conducted, I do believe that there is a positive association between physical activity and type 2 diabetes in African American women, but limited data, including the amount of African American study participants, may have affected the results. Various studies continue to show that exercise can help increase energy, reduce stress, and ultimately help reduce risk of health complications.

Limitations of the Study

There were a few limitations of this study including the use of self-reported data, and the nature of the cross-sectional study. The data for this current study was obtained

from NHANES 2015-2016. NHANES utilizes a multistage group of cross-sectional studies that help monitor and evaluate the health and nutrition status of both children and adults in the United States The main challenge with this self-reported data is the information may not be completely accurate. Subjects knowledge may be limited by what the MyPlate diet is and what it entails. This may have affected their responses of, "yes" or "no" to "Have you tried the MyPlate diet".

Another limitation of this cross-sectional study is difficulty drawing predictive conclusions. Because exposure and outcomes are typically assessed simultaneously, there is generally little to no evidence of a temporal relationship between the two. This makes it difficult to establish a true cause and effect relationship (Solem, 2015).

Recommendations

This current study sheds light on the need for more research in the African American female population as well as research on the MyPlate diet. As previously stated, to address disparities in diabetes specific issues such as diet and exercise, additional research is needed (Kershaw, 2016). My recommendation is that more women, specifically African Americans, become part of research studies because there is little evidence in this particular community. Also, I would recommend that more data becomes available on MyPlate, as it is recommended by the CDC, and is the USDA's current nutritional guide and educational tool.

Implications for Professional Practice and Social Change

Social change implications of this study include furthering research and expanding experimental designs that may introduce new food guides and nutrition plans.

With this, we can increase health and wellness education, in an effort to reduce disease risk. The results of this study may contribute to positive social change by encouraging not only Black women to make lifestyle changes, but also health practitioners to promote wellness and preventive health services in their practices. While Type 2 diabetes has been studied by scholars for years, health disparities have persisted, and scholars have struggled to remedy this chronic disease among non-Hispanic Black women (Journal of the American Medical Association, 2005). As such, this research study was designed to examine Black women's knowledge of lifestyle and behavioral practices as it relates to disease prevalence and prevention.

More research into the process of behavioral change can reveal opportunities for improvement and effective interventions (Hartley, 2014). According to Tija (2008), little emphasis has been placed on soliciting behavioral change as it relates to diabetes education, and possible costs associated with these concerns. From a medical standpoint, research shows that less than 44% of physicians indicated that they routinely provide educational material(s) to patients (Tran, Walker, Wassersug, Matthew, & McLeod, 2017).

My recommendation is that more research and education is done from a culturally diverse perspective. As research continues to show, minority populations are at higher risk of health complications from chronic diseases such as type 2 diabetes (Richardson, 2015). I believe more education is important because, being informed, and having greater knowledge, allows for better decision-making opportunities. Presuming inclusivity in education is more of a perplexity than access, minority groups need to see themselves as

a part of a program, which in turn can help reduce disease burden and improve health status. Many health plans, programs, guidelines, and recommendations limit inclusivity when it comes to culturally diverse groups of people. Furthermore, they do not take into account food and nutrition practices, lifestyles, or physical activities these groups typically participate in. My belief is that more people would be open to try various plans such as the MyPlate plan, if they were more culturally diverse.

I believe knowledge, beliefs, values, and perspectives are all vital to improving overall health. From an educational standpoint, the Health Belief Model and Transtheoretical Theories both describe to us how these beliefs and perspectives can affect overall health. A person's perception is a big part of how and if, they will implement these plans into their everyday practices or not.

As previously described, I believe that if there was a MyPlate Plan specific to African Americans, maybe more African Americans would follow. However, it would have to be culturally appropriate.

My goal was to see how the MyPlate plan affected women in the African American community. My findings show limited information or no association. This further prompts me to question, who was the MyPlate truly intended for? Are studies showing that more Asian Americans are benefitting? Caucasian Americans? Native Americans? Which cultural group receives the greatest benefit from this plan? And what steps are being made to address the other groups who have not shown to benefit as much from the plan, in order to reduce health risks?

I did find that the MyPlate plan was more specific to disease states, such as the Diabetes Plate Method, rather than to culture, for African Americans. There is a variety of reasons why adherence to this plan may be low in certain populations. As previously suggested in the Transtheoretical and Health Belief Models, perception can be a key factor in why individuals make the choices they do. My theory is that many populations fail to adhere to health plans because they do not perceive they are susceptible to disease. Additionally, as it relates to diabetes, individuals may not have the knowledge, or be aware that they have diabetes. Again, statistical data from the CDC showed that 7.3 million adults over age 18 were undiagnosed, or unaware of having diabetes (CDC, 2018).

Utilizing a cultural approach for the MyPlate plan, I believe, will not only help increase adherence to the plan, but also improve research. Statistically, as many of the individual food groups were analyzed in the MyPlate plan, both dairy, and fruits and vegetable food groups were methodically proven to show health benefits and reduce risk of disease by following specific recommendations.

Overall, diet, exercise, and managing weight are lifestyle factors that can help manage diabetes (Mayo Clinic, 2017; Harvard, 2017). A determination of why certain behavioral patterns are more frequently adopted than others can give additional insight on how to address disease prevention efforts. Finally, improving knowledge of health risks can work to reduce disease prevalence, as well as health complication in the future (Richardson, 2015).

Conclusion

The key essence of this study was to examine the extent to which MyPlate diet and physical activity predict Type 2 diabetes in African American women. The findings show that the overall prevalence of type 2 diabetes among African American women was comparable to those nationwide. Additionally, studies showed that the results of the analysis were not statistically significant. There was no association between Type 2 diabetes and the MyPlate diet among African American women in the United States Finally, there was no association found between physical activity and Type 2 diabetes among African American women in the United States The results of the analysis were not statistically significant.

In comparison to the literature review, there is not enough evidence to prove an association between diabetes and the (MyPlate) diet, nor is there enough evidence to prove an association between diabetes and physical activity in my study for African American women.

Overall, it is extremely important for African American women to take action and further the study of preventive care, as it relates to type 2 diabetes in the community. Researchers and public health professionals may utilize their knowledge, including socioeconomic findings, to help promote diabetes prevention and management programs. As the prevalence of type 2 diabetes extends far beyond the African American community, it is equally important for researchers to continue their studies in all races and cultures throughout the United States, in order to help mitigate this disease.

References

Aubrey, A. (2015) From Paleo to plant-based, new report ranks top diets of 2015.

National Public Radio: The Salt: What's on your Plate.

http://www.npr.org/sections/thesalt/2015/01/06/375387779/from-paleo-to-plant-

basednew-report-ranks-top-diets-of-2015

Carico, R., Sheppard, J., & Thomas, C. B. (2020). Community pharmacists and

communication in the time of COVID-19: Applying the health belief model.

Research in Social and Administrative Pharmacy, 17(1), 1984–1987.

https://doi.org/10.1016/j.sapharm.2020.03.017

Centers for Disease Control and Prevention. (n.d.). *Heart disease facts*. Retrieved March

24, 2017 at https://www.cdc.gov/heartdisease/facts.htm

Centers for Disease Control and Prevention (2017). *Physical activity evaluation

handbook*. U.S. Department of Health and Human Services.

http://www.cdc.gov/nccdphp/dnpa/physical/handbook/pdf/handbook.pdf

Centers for Disease Control and Prevention (2020). *National diabetes statistics report

2020: Estimates of diabetes and its burden in the United States*.

https://www.cdc.gov/diabetes/data/statistics-report/index.html

Crawford, M. A., Mendoza-Vasconez, A. S., & Larsen, B. A. (2015). Type II diabetes

disparities in diverse women: The potential roles of body composition, diet, and

physical activity. *Women's Health, 11*(6), 913–927

https://doi.org/10.2217/whe.15.62

American Diabetes Association. (n.d.). *Statistics about diabetes*.

http://www.diabetes.org/diabetes-basics/statistics

DiNicolantonio, J. J., O'Keefe, J. H., Lucan, S. C. (2015). In reply—Fructose as a driver

of diabetes: An incomplete view of the evidence. *Mayo Clinic Proceedings, 90*(7),

988–990. https://doi.org/10.1016/j.mayocp.2015.04.018

Effoe, V. S., Carnethon, M. R., Echouffo-Tcheugui, J. B., Chen, H., Joseph, J. J.,

Norwood, A. F., & Bertoni, A. G. (2017). The American Heart Association ideal

cardiovascular health and incident Type 2 diabetes mellitus among Blacks: The

Jackson Heart study. *Journal of the American Heart Association, 6*(6), e005008.

https://doi.org/10.1161/JAHA.116.005008

Graham, V. A. (2018). *Effects of micronutrients on HIV-infected African American*

women [Doctoral dissertation, Walden University]. ScholarWorks.

https://scholarworks.waldenu.edu/dissertations/4788/

Hartley, M. (2014). Lifestyle modifications as first line of treatment for chronic diseases.

Journal of Diabetes Metabolic Disorder Control. *1*(2), 35-39.

htpps://doi.org/10.15406/jdmdc.2014.01.00009

Hugues, S. (2020). Why you should use MyPlate to plan diabetic meals. *Very Well*

Health. https://www.verywellhealth.com/goodbye-food-pyramidhello-my-plate-

1087135

 Incidence of end-stage renal disease among persons with diabetes—United States, 1990–

2002. (2005). *JAMA, 294*(23), 2962. https://doi.org/10.1001/jama.294.23.2962

Joseph, R. P., Coe, K., Ainsworth, B. E., Hooker, S. P., Mathis, L., and Keller, C. (2018).

Hair as a Barrier to Physical Activity among African American Women: A

Qualitative Exploration. *Public Health, 5*(367).

https://doi.org/10.3389/fpubh.2017.00367

Kershaw, K. N., & Pender, A. E. (2016). Racial/ethnic residential segregation, obesity

and diabetes mellitus. *Current Diabetes Reports, 16*(11), 1-11.

https://doi.org/10.1007/s11892-016-0800-0

Kerska, K. (n.d.). My Plate: Understanding the dietary guidelines for Americans.

National Center for Health Research. https://www.center4research.org/my-plate-

dietary-guidelines/

Kirch, W. (Ed.). (2008). Health belief model. *Encyclopedia of Public Health*. Springer.

https://doi.org/10.1007/978-1-4020-5614-7_1362

Koh, H. K. (2009). Leadership in public health. *Journal of Cancer Education, 24*(Supp.

2), S11–S18. https://doi.org/10.1080/08858190903400385

Mann, C. J. (2003). Observational research methods. Research design II: Cohort, cross

sectional, and case-control studies. *Emergency Medicine Journal, 20*(1), 54–60.

https://doi.org/10.1136/emj.20.1.54

Mayberry, L. S., Bergner, E. M., Chakkalakal, R. J., Elasy, T. A., Osborn, C.Y. (2016).

Self-care disparities among adults with Type 2 diabetes in the USA. *Current*

Diabetes Reports, 16(11), 1–13 https://doi.org/10.1007/s11892-016-0796-5

National Institutes of Health. (2018). *Factors contributing to higher incidence of diabetes*

for Black Americans. https://www.nih.gov/news-events/nih-research-

matters/factors-contributing-higher-incidence-diabetes-black-americans

Palmer, J. R., Castro-Webb, N., Bertrand, K., Bethea, T. N., & Denis, G. V. (2017). Type

II diabetes and incidence of estrogen receptor negative breast cancer in African

American women. *Cancer Research, 77*(22), 6462–6469.

https://doi.org/10.1158/0008-5472.can-17-1903

Richardson, L. (2015). *The association between dietary patterns and diabetes status*

among U.S. Adults. [Doctoral Dissertation, Walden University]. ScholarWorks.

https://scholarworks.waldenu.edu/cgi/viewcontent.cgi?article=2904&context=diss

ertations&httpsredir=1&referer=

Robinson, J., Tidwell, D., Briley, C., Williams, R., Taylor, W., & Treadgill, P. (2015).

Eves Apple: A faith-based nutrition education pilot program for African

American women. *American Journal of Health Studies, 30*(2), 81-89.

Schwingshakl, L., Bogensberger, B., Hoffmann, G. (2018). Diet quality as assessed by

the Healthy Eating Index, Alternate Healthy Eating Index, Dietary Approaches to

Stop Hypertension Score, and Health Outcomes: An updated systematic review

and meta-analysis of cohort studies. *Journal of the Academy of Nutrition and*

Dietetics. 118(1), 74-100. https://doi.org/10.1016/j.jand.2017.08.024

Skinner, C. S., Tiro, J., & Champion, V. L. (2015). The health belief model. In K. Glanz,

B. K. Rimer, & K. "V." Viswanath (Eds.), *Health behavior: Theory, research,*

and practice (75–94).

Solem, R. S. (2015). Limitation of a cross sectional study. *American Journal of*

Orthodontics and Dentofacial Orthopedics. 148(2), 205. Doi:

https://doi.org/10/10.16/j.ajodo.2015.05.006

Taylor, R. B. (2020). What increases my risk of diabetes?

www.webmd.com/diabetes/guide/risk-factors-for-diabetes#1.

Tijia, J., Givens, J. L., Karlawish, J. H., Okoli-Umeweni, A., Barg, F. K. (2008). Beneath the surface: discovering the unvoiced concerns of older adults with type 2 diabetes mellitus. *Health Education Research*, *23,* 40-52.

Tran, S., Walker, L., Wassersug, R., Matthew, A., & McLeod, D. (2014). What do Canadian uro-oncologists believe patients should know about androgen deprivation therapy. *Journal of oncology pharmacy practice*, *20*(3), 199-209.

Tseng, H.-M., Liao, S.-F., & Chuang, Y.-J. (2017). Stages of change concept of the transtheoretical model for healthy eating links health literacy and diabetes knowledge to glycemic control in people with Type 2 diabetes. *Primary Care Diabetes, 11*(1), 29–36. https://doi.org/10.1016/j.pcd.2016.08.005

Weil, A. (2017). The ant-inflammatory diet. https://www.drweil.com/diet%20nutrition/anti-inflammatory-diet-pyramid/dr-weils-anti-inflammatory-diet/

Appendix A: National Health and Nutrition Survey, 2015–2016 Data Questionnaire, My

Plate Plan

CBQ611 - Tried My Plate plan

Variable Name:
CBQ611
SAS Label: Tried
My Plate plan
English Text:
{Have you/Has SP} tried to follow the recommendations in the My Plate plan?
Target:
Both males and females 16 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative
1	Yes	446	446
2	No	794	1240
7	Refused	0	1240
9	Don't know	5	1245

{Have you/Has SP} heard of My Plate?
YES.. 1
NO 2
REFUSED 7
DON'T KNOW..9

{Have you/Has SP} looked up the My Plate plan on the internet?
YES.. 1
NO 2
REFUSED 7
DON'T KNOW..9

{Have you/Has SP} tried to follow the recommendations in the My Plate plan?
YES..1
NO 2
REFUSED 7
DON'T KNOW..9

NHANES data regarding diabetes incidence use the survey question:

{Other than during pregnancy, {have you/has SP}/{Have you/Has SP}} ever been told by a doctor or other health professional that {you have/{s/he/SP} has} diabetes or sugar diabetes?

YES.. 1
NO ....……………..2
BORDERLINE OR PREDIABETES 3
REFUSED 7
DON'T KNOW..9

Appendix B: National Health and Nutrition Survey, 2015–2016 Data Questionnaire,

Physical Activity

PAQ665 - Moderate recreational activities

Variable Name:
 PAQ665
SAS Label:
 Moderate recreational activities **English**
Text:
 In a typical week {do you/does SP} do any moderate-intensity sports, fitness, or
 recreational activities that cause a small increase in breathing or heart rate such as
 brisk walking, bicycling, swimming, or volleyball for at least 10 minutes
 continuously?
Target:
 Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative
1	Yes	2956	2956
2	No	4003	6959
7	Refused	0	6959
9	Don't know	4	6963
.	Missing	2292	9255

Sample survey questions include:

Physical Activity 1. Do you engage in moderate work activity?

2. Do you engage in moderate recreational activity?

3. Minutes moderate work activity

4. Minutes moderate recreational activity

High = affirmative to Q1 or Q2, minutes moderate work activity •300 minutes/week, or

minutes moderate recreational activity • 300 minutes/week.

Medium = affirmative to Q1 or Q2 but between 150 – 300 minutes/week Low =

negative to Q1 or Q2, minutes moderate work activity 150 minutes/week, or

minutes moderate recreational activity

Appendix C: National Health and Nutrition Survey, 2015–2016 Data Questionnaire,

Diabetes

DIQ010 - Doctor told you have diabetes

Variable Name:
DIQ010
SAS Label:
Doctor told you have diabetes
English Text:
The next questions are about specific medical conditions. {Other than during pregnancy, {have you/has SP}/{Have you/Has SP}} ever been told by a doctor or health professional that {you have/{he/she/SP} has} diabetes or sugar diabetes?
English Instructions:
CAPI INSTRUCTION: IF SP AGE < 15, DISPLAY "HAVE SP" FOR THE FIRST DISPLAY AND "SP HAS" FOR THE SECOND DISPLAY. IF SP IS FEMALE AND AGE >= 20, DISPLAY "OTHER THAN DURING PREGNANCY, {HAVE YOU/HAS SP}".
Target:
Both males and females 1 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative
1	Yes	856	856
2	No	8568	9424
3	Borderline	147	9571
7	Refused	0	9571
9	Don't know	4	9575
.	Missing	0	9575