

2018

# Health Literacy and Hypertension Management in Haitian Immigrants

Suzie Jean  
*Walden University*

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# Walden University

College of Health Sciences

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Suzie Jean

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2018

Abstract

Health Literacy and Hypertension Management in Haitian Immigrants

by

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MBA, Plymouth State University, 2011

MS, University of Texas at Dallas, 2010

BS, University of Memphis, 2008

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Health

Walden University

December 2018

## Abstract

Patient compliance and health care communication are impacted by health literacy. Poor health choices, frequent hospital visits, noncompliance with health regimens, and higher health costs are all associated with low health literacy. The purpose of this cross-sectional study was to determine whether there was an association between health literacy as measured by primary language spoken in the home (Creole vs. English) and hypertension self-management as measured by regular use of medication and cutting down on foods high in salt, and whether there was an association between Haitian men, women, their education level, or level of poverty in relation to health literacy as measured by the primary language spoken at home (English or Creole) and hypertension self-management as measured by regular use of medication and cutting down on foods high in salt. The conceptual framework used for the study was the second language acquisition theory. Strategic sampling was used to identify 318 Haitian participants; however, only 36 respondents qualified as Haitian immigrants with a relatively high propensity of hypertension. Logistic regression was used to analyze the data. The results showed no statistically significant relationship between language spoken at home and hypertensive medical compliance within the New York Haitian immigrant community. The other variables age and household income proved to be statistically significant, however gender and education did not appear to have as much of an influence on hypertensive medical compliance observed in the participants. The social change implications include the need for health care staff to be aware of the roles that age, gender, income, language, culture, and education may play in regard to health literacy and hypertension medical compliance.

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## Dedication

This work is dedicated to my mother, Clermeline Thervil, and father, Verilien Jean, who did not have the opportunity to attend school beyond the middle school level. Thank you for understanding the importance of education and ensuring that my siblings and I were given the best education available to us, even if it meant you two had to work multiple jobs to afford it. Thank you for always believing in me and encouraging me to achieve my dreams.

To my late brothers, Berry Jean and Justin Manning, thank you for always treating me like a Queen and for always reminding me to never settle. You guys were my biggest cheerleaders. I wish you both were here with me today physically, but God had other plans. This work is a small token of my appreciation to you two. I love you Kings beyond words.

To Momma Venus, I am not sure how to say thank you. You have been an inspiration to me since the day I met you. Thank you for always supporting me. Your loyalty and faithfulness are unwavering. I love you Momma.

Lastly, to my nieces, nephews, goddaughter, godson, and future kids, always remember that you can do anything you want in life, follow your dreams. I love you all.

## Acknowledgments

I want to thank God for giving me the patience and determination to complete this dissertation; and my family and friends for their encouragement and support throughout this lengthy and often strenuous period of my life.

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I owe this great achievement to my family and friends who encourage me daily to continue to chase my dreams and believe in me. You know who you are. God bless you all.

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## Chapter 1: Introduction to the Study

Approximately 90 million adults in the United States have trouble with comprehending and taking action on health literacy (Davis & Wolf, 2004). Individuals who are socioeconomically disadvantaged, are of older age, immigrants, live in rural areas of the country, and are of racial/ethnic origins are unequally affected by health literacy (Davis & Wolf, 2004). Although hypertension can be found in all race and ethnicities, people of African American origin have the highest hypertension prevalence in the world (Mozaffarian et al., 2015). From 2009 to 2012 among U.S. adults with hypertension, 54.1% had it under control, 76.5% were under treatment, 82.7% were aware that they had hypertension, and 17.3% were undiagnosed (Mozaffarian et al., 2015).

The purpose of this study was to evaluate whether immigrants from Haiti residing in the United States fail to adhere to their hypertension medical regimens due to health literacy. The death rate resulting from high blood pressure increased 8.2% overall from 2003 to 2013. However, there was an 18.4% increase in the mortality rate of African Americans due to hypertension (Mozaffarian et al., 2015). Hypertension has an impact on the deaths of many African Americans annually. Also, there is a \$100 billion cost associated with morbidity and death due to medication adherence annually (Brown & Bussell, 2011). In this chapter, further information on the background of the problem, purpose, and significance of this study will be discussed. Other sections reviewed in this chapter include the hypotheses and research questions, problem statement, nature of the

study, study definitions, theoretical framework, assumptions, scope and delimitations, and limitations of the study.

### **Background of the Problem**

Being able to understand and identify health literacy burdens amongst the U.S. Haitian immigrant population can assist in overcoming some of the obstacles regarding hypertension. It is important to ensure Haitian immigrants have an opportunity for proper health and wellness while residing in the United States. Nwosu and Batalova (2014) outlined knowledge on the history of the U.S. Haitian immigrant population and helped illustrate the constant growth of this community in the United States. Many different methods have been used to help the African American population follow through with their hypertension treatments (Ferdinand, 2013). However, Jean-Charles (2014) and Shipp (2000) showed that there is an increasing prevalence of hypertension in the Haitian immigration population. Sanson et al. (2014) defined hypertension and the hypertension management from the eye of the Haitian immigrant. Spears (2014) examined the history of the Haitian Creole language and explained that Haitian Creole is a predominately-spoken language compared to English, which is both spoken and written equivalently. Pierre (2012) and Lubetkin et al. (2015) provided details on the health status and health literacy of the Haitian immigration community and on what their cultural beliefs and views of hypertension may be.

It is important that patients have adequate health literacy, so that they are able to successfully access medical information and make the appropriate decisions about their health. Lower levels of health literacy may play a part in the increased number of health

care use, poor health care outcomes, and a higher risk of mortality (Berkman, Sheridan, Donahue, Halpern, & Crotty, 2011). The Patient Protection Affordable Care Act (2010) illustrated the importance of having comparative and efficient research, greater use of evidence-based medicine, collective decision making, valuable material, and transparency of cost (Andrulis et al., 2010). Organizations relied on distributing written materials to promote the before mentioned methods (US Department of Health and Human Services, Office of Disease Prevention and Health Promotion [USDHHS], 2010). However, the ability to access written language can be complicated by a person's health literacy levels, cultural, and language differences. Haitian immigrants are a unique subgroup of the African American community and warrant a more specific approach to health promotion based off of their belief system and health habits (Allen et al., 2013). According to Lubetkin et al. (2015), there have been no articles published to date that review health literacy in the Haitian community.

### **Problem Statement**

Hypertension is classified as one of the deadliest cardiovascular diseases in the United States. The leading causes of death in the United States are cardiovascular-related diseases (Center for Disease Control and Prevention [CDC], 2013). Hypertension, which is commonly referred to as high blood pressure, is considered a vital measurement and is taken at every hospital visit any individual encounters. It can be defined as the force against the walls of the arteries as the heart pumps blood through the body (Hypertension, 2012). Haitian immigrants relocate to the United States for many reasons, including political refuge and the search for better economic opportunity. The Haitian community



overall lacks an understanding of hypertension; as a result, they are not able to understand the severity associated with the disease (Sanon, Mohammed, & McCullagh, 2014). Haitian Creole is predominately an oral language among the Haitian society. Haitian immigrants may be reliant on this oral tradition to attain their health information and wellness (Spears, 2014). A greater level of hypertension understanding may enable better patient acquiescence and hypertension control (Pierre, 2012). Better patient management and compliance of hypertension may, in turn, result in fewer deaths and other cardiovascular illnesses due to this deadly disease (Roger et al., 2012).

There have been no studies to date that have tested the relationship between language and hypertension in the Haitian immigrant community in the United States. Prior research has focused on explaining ignorance, noncompliance, and the connection between hypertension and social and biological factors in the Haitian community (Mazzeo, 2013). Price (2003) mentioned that adverse environmental conditions, limited access to medical care, unhealthy lifestyles, early life experiences, social stressors, and lack of social support are all factors associated with hypertension control in the African American community. Although there are many influences that may contribute to hypertension noncompliance in the Haitian community, it is fundamental for doctors to comprehend the importance of educating the Haitian community on hypertension in Haitian Creole. Haitian Creole should be the language used for the initial diagnosis to ensure better comprehension and management of their hypertension levels (Rapi, 2002). This change will contribute to decreasing the number of deaths annually that result from uncontrolled levels of hypertension (Rapi, 2002). This study can be used to show health

care professionals the importance of effectively communicating hypertension and the appropriate medical regimens to Haitian immigrants upon diagnosis to ensure compliance and may serve as a foundation for further research studies on comprehension hypothesis in health care overall.

### **Purpose of the Study**

The purpose of this cross-sectional study was to determine whether the language that is used to deliver the hypertension diagnosis to the Haitian population has an impact on their medical compliance. The variables (sex, income, and education level amongst Haitian Adults living in New York) were compared in relation to the primary language spoken at home (English or Creole). A quantitative retrospective approach was used to address whether the prior mentioned variables and ensuring the comprehension of hypertension information to Haitian immigrants in their preferred language of communication had any effect on their overall compliance for the disease. Parents who speak a language other than English at home have an impact on children's health and health care (Flores, Abreu, & Tomany-Korman, 2005). Therefore, language spoken at home was used as a proxy for health literacy in this study. An in-depth look, via statistical analysis, into the problem statements and the data from a previous research study was used to examine the stated hypotheses.

### **Research Questions and Hypotheses**

The research questions and hypotheses that were used as a guide for this study were the following:

RQ1: Is there an association between health literacy, as measured by primary language spoken in the home (Creole vs. English), and hypertension self-management, as measured by regular use of medication and cutting down on foods high in salt?

*H<sub>0</sub>1a*: There is no association between health literacy as measured by primary language spoken in the home (Creole vs. English) and hypertension self-management as measured by regular use of medication.

*H<sub>1</sub>1a*: There is an association between health literacy as measured by primary language spoken in the home (Creole vs. English) and hypertension self-management as measured by regular use of medication.

*H<sub>0</sub>1b*: There is no association between health literacy as measured by primary language spoken in the home (Creole vs. English) and hypertension self-management as measured by cutting down on foods high in salt.

*H<sub>1</sub>1b*: There is an association between health literacy as measured by primary language spoken in the home (Creole vs. English) and hypertension self-management as measured by cutting down on foods high in salt.

RQ2: Is the association between health literacy, as measured by primary language spoken in the home (Creole vs. English), and hypertension self-management, as measured by regular use of medication and cutting down on foods high in salt affected by gender?

*H<sub>0</sub>2a*: There is no association between health literacy as measured by primary language spoken in the home (Creole vs. English) and hypertension self-management as measured by regular use of medication and gender.

*H<sub>1</sub>2a*: There is an association between health literacy as measured by primary language spoken in the home (Creole vs. English) and hypertension self-management as measured by regular use of medication and gender.

*H<sub>0</sub>2b*: There is no association between health literacy as measured by primary language spoken in the home (Creole vs. English) and hypertension self-management as measured by cutting down on foods high in salt and gender.

*H<sub>1</sub>2b*: There is an association between health literacy as measured by primary language spoken in the home (Creole vs. English) and hypertension self-management as measured by cutting down on foods high in salt and gender.

RQ3: Is the association between health literacy, as measured by primary language spoken in the home (Creole vs. English), and hypertension self-management, as measured by regular use of medication and cutting down on foods high in salt affected by annual household income?

*H<sub>0</sub>3a*: There is no association between health literacy, as measured by primary language spoken in the home (Creole vs. English), and hypertension self-management, as measured by regular use of medication and annual household income.

*H<sub>1</sub>3a*: There is an association between health literacy, as measured by primary language spoken in the home (Creole vs. English), and hypertension self-management, as measured by regular use of medication and annual household income.

*H<sub>0</sub>3b*: There is no association between health literacy, as measured by primary language spoken in the home (Creole vs. English), and hypertension self-management, as measured by cutting down on foods high in salt and annual household income.

*H<sub>1</sub>3b*: There is an association between health literacy as measured by primary language spoken in the home (Creole vs. English) and hypertension self-management as measured by cutting down on foods high in salt and annual household income.

RQ4: Is the association between health literacy, as measured by primary language spoken in the home (Creole vs. English), and hypertension self-management, as measured by regular use of medication and cutting down on foods high in salt affected by education?

*H<sub>0</sub>4a*: There is no association between health literacy as measured by primary language spoken in the home (Creole vs. English) and hypertension self-management as measured by regular use of medication and education.

*H<sub>1</sub>4a*: There is an association between health literacy as measured by primary language spoken in the home (Creole vs. English) and hypertension self-management as measured by regular use of medication and education.

*H<sub>0</sub>4b*: There is no association between health literacy, as measured by primary language spoken in the home (Creole vs. English), and hypertension self-management, as measured by cutting down on foods high in salt and education.

*H<sub>1</sub>4b*: There is an association between health literacy, as measured by primary language spoken in the home (Creole vs. English), and hypertension self-management, as measured by cutting down on foods high in salt and education.

### **Theoretical Framework**

The theoretical base for this study was the second language acquisition theory and the comprehension hypothesis of the second language acquisition. The comprehension hypothesis states that humans acquire language when they understand messages that contain aspects of language (vocabulary, grammar) that they have not yet acquired, but are ready to acquire (Krashen, 2013). Language acquisition is a subconscious process, and several effective variables are related to success in language acquisition including instrumental motivation (Krashen, 2009). The comprehension hypothesis is derived from the input hypothesis that states that the input provided for learners must be tuned to their level of proficiency (Latifi, Ketabi, & Mohammadi, 2013). This theory was used to explain the results of this study regarding health literacy and hypertension management. This theory is further discussed in Chapter 2.

### **Nature of the Study**

This study was a retrospective quantitative study. The study was retrospective because it consists of data that has been collected via a previous survey. Quantitative researchers examine the relationships between variables to determine quantifiable information about the world. The use of the comprehension hypothesis as a part of the second language acquisition theory allows for the research to be approached in a linguistic aspect. I used this quantitative analysis to determine the importance that language and socioeconomic status play in health care compliance.

### **Definition of Terms**

*Haitian immigrant:* An individual who was born in Haiti however has relocated to the United States.

*Health literacy:* An individual's ability to obtain, interpret, and understand basic medical information and services in order to make effective independent health care decisions (Baker, 2006).

*Hypertension (hypertension):* Hypertension is a blood pressure reading consisting of the systolic reading > than 140 mmHg and the diastolic reading > 90 mmHg (Madhur, Riaz, & Dreisbach, 2014).

*Medication adherence:* Patients acknowledgement and agreement with the medical recommendations given to them (Brown & Bussell, 2011).

*Noncompliance:* Patients who do not take their prescribed medication or follow their prescribed course of treatment (Brown & Bussell, 2011).

### **Assumptions**

In order to proceed with this study, there were two assumptions that were made. In order to confirm significance of the data that were collected for this study, it was necessary to make some assumptions. The first assumption in this study was that all of the patients participating in the survey provided truthful information when completing the survey. The second assumption was that the participants understood the survey questions that were presented to them.

### **Scope and Delimitations**

The scope of the study included Haitian immigrants aged 18 and older living in New York City who speak both English and Haitian Creole, therefore excluding all of the other participants of the study who speak other languages and may be experiencing similar cardiovascular-related chronic diseases.

### **Limitations**

There were numerous limitations involved with this study including the small group of study participants from a particular geographic location, the use of retrospective data, its cross-sectional design, and the assumption that the participants answered all survey questions truthfully. Another limitation of this study was the selection criterion for the one individual interviewed within the household. The adult selected to conduct the telephone interview only represented one person within a household that may contain many adults who may also have hypertension but manage it differently. According to Babbie (2007), studies that have a cross-sectional design do not support generalizing the research to fit other population groups, and the results of the study may not be expended to represent any causal relationships between any of the variables.

### **Significance of the Study**

The study can help the public health community better understand why only 26% of the 86% of the hypertensive Haitian immigrant population in the United States has their hypertension under control (Sanon, 2013). This study is important because the Haitian immigrant population, which consisted of 907,790 individuals in 2011, was the second largest African American immigrant population in the United States (Buchanan,



Albert, & Beaulieu, 2010). I will attempt to fill a gap in public health by using Haitian Creole to educate the Haitian immigrant population in the United States on hypertension. It is also important to concentrate on this community to help reach the Healthy People 2020 goal to increase the number of people with hypertension who have their blood pressure under control to 61% (USDHHS, 2012). Another goal listed in Healthy People 2020 is to “achieve health equity and eliminate health disparities” Braveman, Egerter, & Williams, 2011, p. S149). Immigrants who speak English as a second language are at a social disadvantage (Cho, 2000). Health disparities are systematically linked to social disadvantages, thereby causing the immigrants to be further disadvantaged in their health (Braveman et al., 2011). Insights from this study can be used with results from other studies previously conducted on hypertension management in the Haitian community to further educate physicians on how to communicate hypertension and the appropriate medical regimes to not only the Haitian immigrants but also to all immigrants in the United States.

Fifty-six percent of the 61.8 million U.S. residents who speak a foreign language at home are immigrants (Camarota & Zeigler, 2014). Immigrants are subject to language and health literacy difficulties, which become worsened by their cultural barriers and the economic challenges that they face in receiving and understanding relevant health information (Kreps & Sparks, 2008). It is important to identify and examine the relevant cultural issues that are likely to affect immigrants, as this tends to influence their health beliefs, values, and norms, which alters their health communication overall (Kreps & Sparks, 2008). Current efforts to provide immigrant populations with relevant health

information to allow them to make educated decisions about their health are insufficient (Thomas, Fine, & Ibrahim, 2004). Many vulnerable immigrant consumers in the United States are non-native English speakers who encounter language and health literacy challenges daily, and it is necessary to adapt to their health communication needs to be able to provide them with the essential health information (Kreps, 2006).

Doctors who were trained on how to educate their patients properly on hypertension had more patients in compliance than physicians who were not trained on how effectively to educate their patients (Inui, Yourtee, & Williamson, 1976). If a doctor can effectively teach a patient what he or she needs to know about hypertension and how vital it is for him or her to follow his or her treatment regimen to control his or her blood pressure, then the number of deaths and related cardiovascular diseases annually that are a result of hypertension will be reduced (Rapi, 2002). If physicians and other health care professionals who are in direct contact with immigrants in the United States can ensure comprehension of hypertension, then the members of these different communities would have an opportunity to make a more educated decision on hypertension treatment plans (Krisberg, 2004). This change can also help decrease the mortality and morbidity rates of cardiovascular-related diseases annually for the immigrant population in the United States overall.

### **Summary**

Being able to make a decision on hypertension medication regimen is essential for the wellness and health outcomes of Haitian immigrants with hypertension. English as a second language may cause Haitian immigrants not to understand their hypertension

medication regimen. In this chapter, I highlighted how health literacy, specifically English as a second language, can lead to unfavorable health outcomes for Haitian immigrants with hypertension in the United States. Second language acquisition theory was also discussed as the theoretical framework, and the terms of the study were defined. The focus and scope of the study, the gap in the literature, assumptions, and limitations were also discussed in this chapter. Chapter 2 will provide a more in-depth literature review of the overall Haitian population, hypertension, and medication adherence.

## Chapter 2: Literature Review

### Introduction

This review is organized into six different sections. The first section contains the definition, history, and significance of hypertension in the United States. I will then present the theoretical framework, which will be used to describe the relationship between language, comprehension, and compliance in the study participants. The remaining sections include articles on the Haitian immigration community, the health status of Haitian immigrants, language barriers in health care, and physician-patient communication and compliance.

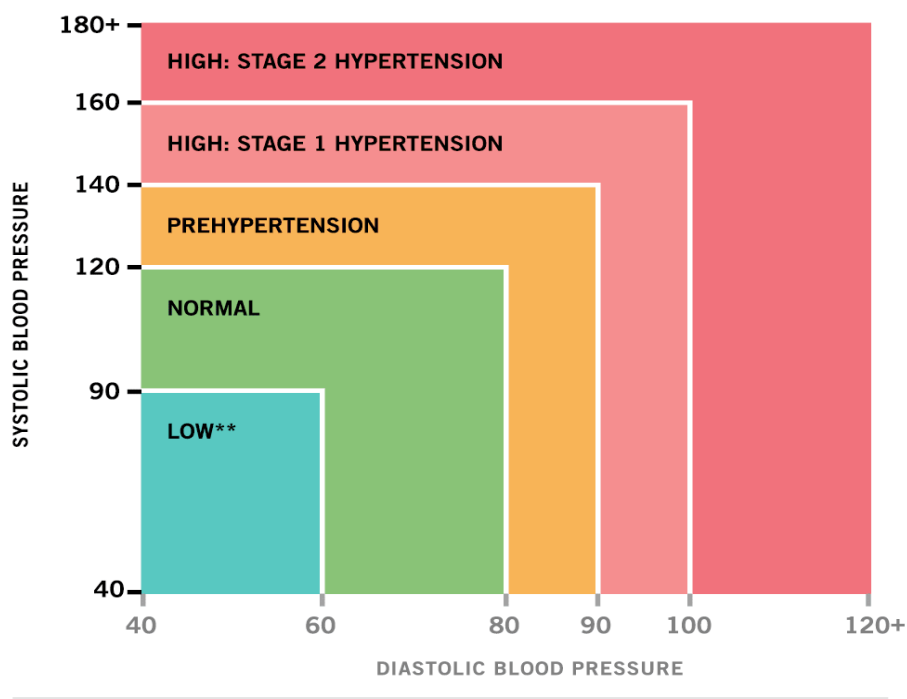
Literature searches were conducted electronically through remote access of different research article databases through the Walden University Library. The databases used were Proquest, Google Scholar, MEDLINE, ProMed, NCBI, and EBSCOhost. The following terms were used for the literature review search: *hypertension, hypertension prevalence, hypertension in Haiti, Haitian Creole, communication barriers in health care, physician-patient communication, English as a second language, immigrant health care, health literacy, English as a second language, second language acquisition, comprehension hypothesis, and minority health care compliance*. There were over 500 published articles, books, and studies to choose from. The majority of the studies consisted of published literature dated between the years 2000 to 2016 to ensure a more accurate and up-to-date review. However, there were some articles from 1985–1999 that had to be used due to lack of current research on some of the topics in the literature review.

## Hypertension

Hypertension is classified as one of the deadliest cardiovascular diseases in the United States. Cardiovascular-related diseases are the leading causes of death in the United States (CDC, 2015). Hypertension, also known as high blood pressure or tansyon as spoken in Haitian Creole, is measured as the force against the walls of the arteries as the heart pumps blood through the body (Hypertension, 2012). Approximately 76.4 million United States adults aged 20 and older are hypertensive (Roger et al., 2011). That is equivalent to one in every three adults in the United States being hypertensive. Multiple factors contribute to the pathogenesis of hypertension (Gandhi et al., 2001). Hypertension has an immunological basis, and cytokines derived from T-cells and T lymphocytes play a significant role in hypertension (Madhur et al., 2014). Hypertension occurs when the heart is pumping blood at a rate in which the arteries cannot sustain and as a result they become weak.

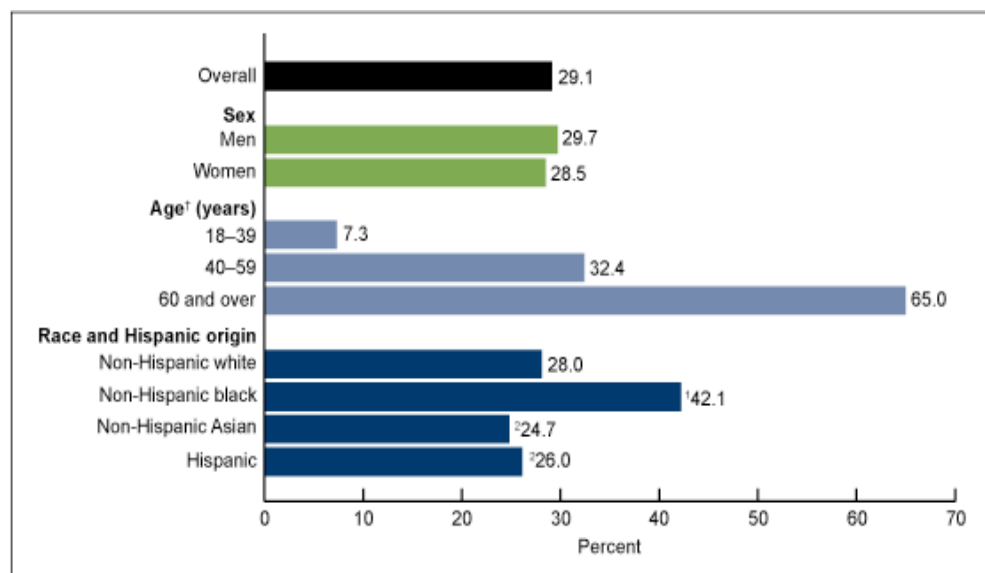
Hypertension may be primary, meaning it develops naturally as a result of a person's environment or genetically, or it can be secondary, which can have multiple etiologies, including but not limited to vascular, renal, or endocrine causes (Madhur et al., 2014). Hypertension consists of a systolic, when the heart is contracting, and diastolic, when the heart is relaxing, measurement (Elliott & Coventry, 2012). An individual is diagnosed with hypertension when his or her systolic blood pressure is 140 mm Hg or more, and his or her diastolic blood pressure is 90 mm Hg or more (Madhur et al., 2014). There are four different classifications of hypertension. Normal consists of a systolic lower, than 120 mm Hg, and a diastolic less than 80 mm Hg (Chobanian et al., 2003).

Prehypertension consists of a systolic of 120-139 mm Hg and a diastolic of 80-89 mm Hg (Chobanian et al., 2003). Stage 1 consists of a systolic of 140-159 mm Hg and a diastolic of 90-99 mm Hg (Chobanian et al., 2003). Lastly, there is Stage 2, which consist of a systolic of 160 mm Hg or greater and diastolic of 100 mm Hg or greater (Chobanian et al., 2003). The above classifications can only be determined after two or more visits and are the result of the average of two or more blood pressure readings (Chobanian et al., 2003). Figure 1 below depicts the systolic and diastolic blood pressure ranges for the before mentioned stages of hypertension.



*Figure 1.* Blood pressure chart: A quick reference of blood pressure levels of adults 18 and older. SOURCE: NHLBI, Seventh report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (2016).

Hypertension is a worldwide epidemic, and approximately 20% of the world's adults are believed to have Stage 1 hypertension (Madhur et al., 2014). Until the age of 45, more men than women have hypertension, and from 45-years-old and onward the number of males and females with hypertension are almost equal. Globally, African American adults have a higher prevalence of hypertension and have a 1.3 fold higher rate of nonfatal stroke, 1.8 fold higher rate of fatal stroke, 1.5 fold higher mortality rate due to heart disease, and a 4.2 fold higher rate of end-stage renal disease than European American hypertensive adults (Madhur et al., 2014). Figure 2 below explains the prevalence of hypertension amongst adults aged 18 and over in the United States from 2011 to 2012.



*Figure 2.* Age-specific and age-adjusted prevalence of hypertension among adults aged 18 and over: United States, 2011-2012. SOURCE: CDC/NCHS, National Health and Nutrition Examination Survey. (2011-2012 year)

Hypertension is treated with prescribed antihypertensive medication, lifestyle modifications, and surgical interventions. Medication and treatments vary based on whether a person has primary or secondary hypertension and his or her stage of hypertension. Lifestyle modifications consist of dietary changes that reduce the amount of sodium and fat in an individual's diet, increasing the amount of exercise he or she partakes in, and quitting smoking.

### **(a) Hypertension and Sex**

There is no difference in the prevalence of hypertension and sex amongst adults in the United States. Between 2011 and 2014, the prevalence of hypertension amongst adults was 29%: 30% for men and 28.1% for women (Yoon, Fryar, & Carroll, 2015). However, in the African American community, 45.7% of woman and 43% of men have hypertension (Mozaffarian et al., 2015). The Haitian Immigrant community is classified as African American in the United States for the purpose of health surveys. Banegas et al. (2008) concluded that gender differences in hypertension control remained almost unchanged after adjusting for risk factors, hypertension duration, the number of antihypertensive drugs, and age.

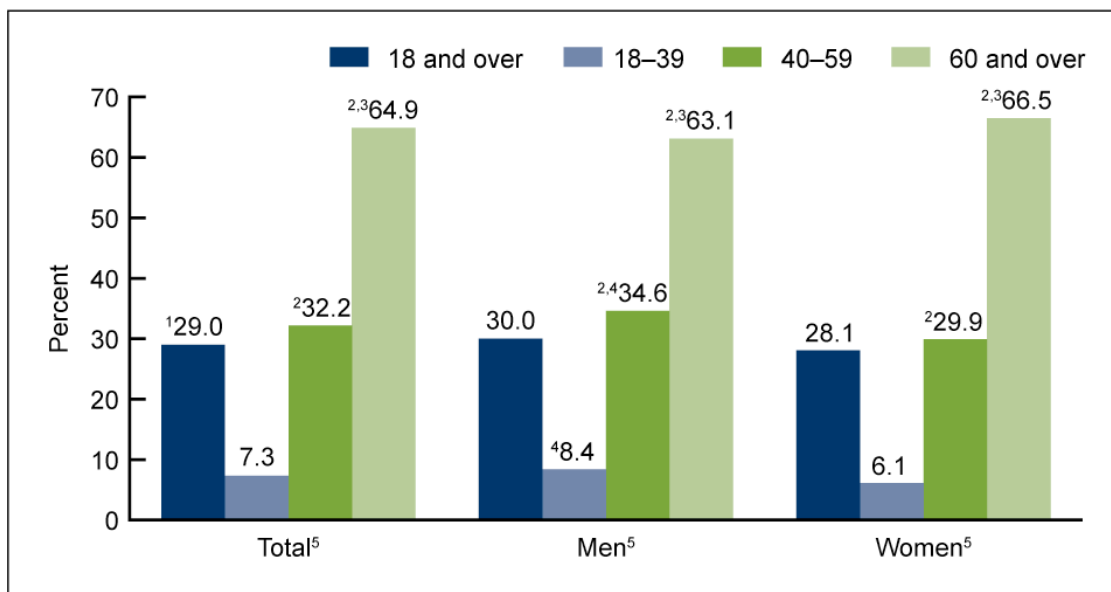
### **Hypertension and Age**

Several studies associate hypertension with an increase in age (American Heart Association [AHA], 2013; Keenan & Rosendorf, 2011). The National Health and Nutrition Examination Survey (NHANES) indicated that between 2007 and 2010, about 9.8% of U.S. civilians 18-44 years of age had hypertension, 40.4% of persons aged 45-64 years of age, and 71.6% of persons 65 and above have hypertension (as cited in Gillespie



& Hurvitz, 2013). Peters and Templin (2008) found age to be a vital factor to be considered when discussing hypertension self-management strategies. Uncontrolled hypertension affects adults of all ages, and the appropriate measures need to be taken to combat the epidemic.

In this study, I examined the effect of health literacy on hypertension self-management among Haitian Immigrants in the United States aged 18-64 years old. Therefore age had a confounding effect on this study and was accounted for in the analysis. Figure 3 below explains the prevalence of hypertension in the United States during the period 2011-2014.



*Figure 3.* Prevalence of hypertension among adults aged 18 and over, by sex and age: United States, 2011-2014. SOURCE: CDC/NCHS, National Health and Nutrition Examination Survey. (2011-2014 year)

### **Hypertension and Income**

The NHANES indicated that between 2007 and 2010, about 32.8% of U.S. residents with a family income to federal poverty threshold below 100% had hypertension, 32.5% of families between 100-199% threshold, 30.6% of families between 200-399% threshold, 28% of families between 400-499% threshold, and 27.6% of families 500% and above threshold had hypertension (as cited in Gillespie & Hurvitz, 2013). Individuals with less education and low income were more overweight and exercised less and had higher blood pressure (Brummett et al., 2011). Lower household income was most strongly associated with elevated hypertension (Brummett et al., 2011). Brummett et al. (2011) found that after adjusting for all of the before mentioned covariates in the study, income had an autonomous effect on hypertension. An increase in income by \$50,000 annually was associated with having a systolic blood pressure (SBP) 0.6-mm HG lower (Brummett et al., 2011). Reverse casualty is generally not an issue because education is often remembered and not affected by adult health later on. However, adult health could affect income, which may result in poor health contributing to decreased working wages and vice versa.

### **Hypertension and Education**

There are not many studies to date that have compared education level to hypertension. Considering their level of education and their migration to the United States, the health literacy levels of Haitian immigrants when compared to native-born Americans may be lower (Martin et al., 2009). According to Loucks, Abrahamowicz, Xiao, and Lynch (2011), during a 30-year life span, there is an inverse relationship

between education and higher SBP, and there is a stronger association in woman compared to men. The mean SBP over 30 years was higher for individuals with fewer than 12 years of formal education than those with 17 years of formal education after adjusting for age (Loucks et al., 2011). As education level rises, so does a person's income, which means that the person has a better job and can afford better health care. Health literacy is also increased with an increase in their education level, as they are more likely to understand public health messages.

### **Second Language Acquisition Theory–Comprehension Hypothesis**

Second language acquisition is the study of an individual's ability to acquire another language beyond his or her native language. This theory examines the ability of a person with limited exposure to a second language to be able to create a new language; the model includes aspects of the language that are newly learned and what is not learned, how many learners of a second language are able to become as proficient in that second language as they are their native language, and how is it that only some of the individuals are able to achieve this level of proficiency in an alternate language as it relates to the hypotheses regarding the rules of the second language that these learners may follow (Gass, 2009).

Krashen (1981) proposed that children develop another language through acquisition. Krashen focused on the natural gain of language as opposed to the formal education of a language for a child and suggested that natural development of a new language can occur within a school setting. Krashen concluded that children who speak two languages are more likely to use the language that they acquired rather than the

language they learned in a formal setting as a result of a more authentic learning environment. Krashen proposed that the informal and natural version of learning a second language reduces anxiety. Further development of the language acquisition theory led Krashen to develop five different hypotheses: the acquisition-learning hypothesis, the natural order hypothesis, the monitor hypothesis, the comprehension hypothesis, and the affective filter hypothesis. Krashen created the comprehension hypothesis, which answers the question of how language is acquired, as the centerpiece of the language acquisition theory.

According to the comprehension hypothesis, humans develop literacy and learn a language when they understand the message; therefore, when they are able to understand what they are reading and hearing then they have received “comprehensible input” (Krashen, 2003, p. 81). The comprehension hypothesis refers to the subconscious acquisition, not conscious learning, and has a written and verbal aspect (Krashen, 2004). Language acquisition occurs when individuals understand messages and does so without their conscious awareness (Krashen, 2010). Krashen (2010) argued that the information that is made available to learners has to be modified for their appropriate level of understanding and that learners are able to use their knowledge of the world, the context of the conversation, and other linguistic information to compensate for any gaps in their understanding. Krashen hypothesized that language is initially learned by first comprehending the message followed by learning the structure, as opposed to the older outlook of learning, which stated that an individual could acquire language articulation by learning the structure and practicing (as cited in Latifi et al., 2013).

The comprehension hypothesis predicts that the first language can make input more comprehensible when used to provide background information and that it can be of hindrance if it is used in a way that does not support comprehensible input (Krashen, 2004). An individual's primary language helps develop his or her level of literacy and teaches him or her in subjects early in the learning process so that he or she can have a foundation of knowledge that will later transfer over when he or she is learning his or her second language (Krashen, 1996, 2004). The compression hypothesis presumes that if a good foundation is used to teach the first spoken language, it will allow for a more efficient learning process for a second language in the future (Krashen, 2004).

### **Health Literacy**

Health literacy is defined by the U.S. Department of Health and Human Services (DHHS, 2010) as “the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions” (p. #). Unless patients are able to make effective health care decisions based off of their understanding of the information that the clinicians provided to them, then the information that the clinician supplied is of no significance (Benjamin, 2010).

Ultimately, the information did not reach the patient, which is the same as not treating the patient. There are many different ways in which health literacy may differ amongst a single group or within an entire race, and there are a number of disparities that exist related to health literacy in getting access to and the use of technology for health care (Chaudhry et al., 2011). Chaudhry et al. (2011) compared the health literacy of African Americans and European Americans and noted that compared to European Americans,

African Americans were more associated with having little to no access to care and far worse health literacy overall. Amongst the individuals with heart failure, there was a difference in the access of care and health literacy racial disparities (Chaudhry et al., 2011). Low health literacy impacts disadvantaged immigrant groups more due to differences in language and culture (Benjamin, 2010). In adults, low health literacy is directly associated with poor understanding of preventative care services and information (Sanders, Shaw, Guez, Baur, & Rudd, 2009). According to DHHS (2010), health literacy levels are directly affected by linguistic and cultural disparities, which leads to an increase in the number of health differences amongst individuals whose primary language is not English, immigrants, refugees, and racial/ethnic minorities. Health professionals should be able to understand the culture and speak the language of their patients in order to ensure effective communication and complete comprehension of the medical information they are providing (Benjamin, 2010).

### **Haitian Immigration Community**

Haiti, which encompasses the western region of the Hispaniola island, is known for many things including for conducting the first African slave revolt under the order of Toussaint L'ouverture in 1804 to declare its independence as the world's first Black-operated postcolonial nation (Central Intelligence Agency [CIA], 2015). In the western hemisphere, Haiti is the poorest country and it lacks political stability and up-to-date technology (CIA, 2015). Haitians are known for migrating and taking temporary sojourns to other countries (African American Migration Experience [AAME], 2005). Their migration to the United States was encouraged during President John F. Kennedy's

tenure as a result of the Haitian President Duvalier's tyrant behavior to the people of Haiti. Immigration rules and regulations have changed over the years in the United States. However, that has not had any impact on migration of the Haitian population to the United States (AAME, 2005).

In the United States, Haitians make up the second largest immigrated Black population. The greatest concentration of these immigrants resides in Miami, and the second is New York followed by Boston (Buchanan, Albert, & Beaulieu, 2010). They have been victims of negative stereotyping, and no contemporary immigrant group has experienced more discrimination and prejudice (AAME, 2005). These individuals have self-esteem and are proud of their heritage; as a result, life in the United States is often a conflict between pride in their roots and prejudice against them (AAME, 2005). Haitian immigrants are faced with traditional difficulties common to most immigrants compounded by speaking Haitian Creole, a language that is not spoken in any other country in the world (AAME, 2005). Haitian Creole is predominately a spoken language, and as a result of lower formal education attained by many immigrants, they rely on oral communication rather than written communication (Spears, 2010).

Despite having their own cultural experiences and a very distinctive history, Haitian immigrants are included in the black category for census counts in the United States of America (Zéphir, 2004). This misrepresentation leads to miscounting and a misrepresentation of this community. As a result, little is known about the cultural values, everyday life, and socioeconomic status of the Haitian community. (Sanon et al.,

2014). This is also the reason why there is a lack of knowledge in the Haitian immigrant disease management procedures, health, and health promotion (Zéphir, 2004).

Haitians are devout Christians. Survey results confirmed that almost 75 percent of Haitian immigrants in South Florida attend church at least once a week (African American Migration Experience [AAME], 2005). Their religious communities provide a social support system, where Haitian immigrants can go and cope with the constant confrontation of prejudice and discrimination that they still face today in the United States. Most Haitian immigrants confess to dealing with the discrimination and prejudice in the United States by relying on the internal strengths of their culture and remembering the great revolt of their nation's history (AAME, 2005). Haitian Immigrants use the revolt experience to remind them that there is hope and turn towards church for internal peace. The Haitian church community fills many voids for Haitian immigrants including: bringing families together, prayer meetings, economic support, food, and shelter if necessary. For the typical Haitian immigrant household, the family is the foundation. Today, the only legal way to migrate to the United States is to be sponsored by family. Therefore, once an immigrant has arrived in the United States it is now their responsibility to financially support themselves and their family in Haiti while also sponsoring their migration to the United States.

### **Health Status of Haitian Immigrants**

Today Haitian immigrants make up a unique group within the African American community with a different belief system, their own health habits and an interesting culture. They face linguistic, economic, and cultural barriers to integration into



American society that in turn affect their health care utilization, access, and outcomes (Pierre, 2012). A 2005 cross-sectional preventative care study conducted in Miami, Florida determined that approximately 37% of Haitian immigrants did not receive annual physicals. Those who spoke poor English were less likely to have had one, and about 10% of people failed to receive care for their chronic health conditions including hypertension (Saint-Jean & Crandall, 2005). It was determined that the frequency of primary care utilization may have been due to the challenges Haitian immigrants faced with adapting to a healthy lifestyle and navigating their way through the United States health care system (Saint-Jean, Crandall, 2005). The unfamiliarity with medical terminology due to low educational status and their language barrier creates an added challenge for Haitian immigrants (Pierre, 2012).

Many different health beliefs present a threat to the patient provider relationship for physicians who encounter Haitian immigrants. Health care providers are expected to have a wealth of medical knowledge, so providers who ask numerous questions are believed to lack the necessary knowledge to treat them (Pierre, 2012). Treatment regimens are expected to work immediately; therefore individuals will prematurely stop their treatment as a result of perceived recovery or due to a lack of immediate relief (Holcomb, Parsons, Giger, & Davidhizer, 1996). Traditionally Haitians are very hesitant to discuss anything that they may consider personal or private therefore it is often difficult to obtain an accurate patient history as a physician due to lack of information (Pierre, 2012). Due to the matrifocal nature of Haitian households, mothers can either encourage or discourage medical compliance. A common health belief is that sicknesses

are a result of an imbalance with nature, and the use of home remedies such as oils and herbal teas are often used as the first source of treatment (Pierre, 2012).

According to the Patient Protection and Affordable Care Act of 2010, the United States of America's health care system could be more evidence based, there could be more comparative effectiveness research done, there is a need for quality information, transparency of cost, and decision making should be shared (Andrulis, Siddiqui, Purtle, & Duchon, 2010). Organizations tend to rely on written materials to fulfill the before mentioned recommendations (United States Department of Health and Human Services Office of Disease Prevention and Health Promotion [USDHHS ODPHP], 2010). However, it can be difficult to access written language due to the differences in health literacy, and the language and cultural barriers. (Lubetkin et al., 2015). The health literacy of Haitian immigrants has only been assessed by one published article to date (Lubetkin et al., 2015). Health literacy is often measured through the use of written documents and Haitian Creole is a predominately spoken language with direct phoneme-grapheme correspondence, therefore health literacy evaluations of this population is a challenge. This makes it tough to construct a written health literacy test in Haitian Creole (Nurss, Baker, Davis, Parker, & Williams, 1995). Low health literacy rates due to language and culture differences also affect the ability for shared-decision making because Haitian immigrants are not engaged in information-seeking behavior via the internet (McDougald et al., 2013).

### **Language Barriers in Health care**

According to the 2000 U.S. Census, more than 46 million people in the United States do not speak English as their primary language, and more than 21 million speak English less than “very well” (U.S. Bureau of the Census, 2003). Approximately 22 million patients in the United States are affected annually in the health care delivery system by language barriers (Martinez, 2010). Many consequences arise as a result of language barriers between physicians and patients such as missed diagnoses, misinterpreting patient concerns, unnecessary and costly medical exams, potentially dangerous medical errors from the doctor and poor compliance, satisfaction, and follow up from the patients (Institute of Medicine, 2003). Qualified bilingual health care providers are not common and as a result there are not enough in the medical profession to assist these patients in the United States (Sullivan Commission, 2004). Despite the laws requiring linguistic access, health care professionals often depend on friends, family members, nonclinical employees who are untrained, or health care professionals who are not fluent to help streamline the conversation with their patients (Jacobs, Chen, Karliner, Agger-Gupta, & Mutha, 2006).

Title VI of the Civil Rights Act of 1964 requires that all entities receiving federal funds to ensure that persons with limited English proficiency (LEP) have meaningful linguistic access to the health services that they provide (Jacobs et al., 2006). Therefore failure to provide language access is a violation of the Civil Rights Act of 1964. There are also rules and regulations on the state level that require the provision of health care to patients with LEP (Perkins, 2003). Sasha and Fernandez explain the significance of

bridging the language gaps in health care to reduce racial and ethnic disparities and improve the overall health and well being of the nation in their article *Language Barriers in Health Care* (Sasha & Fernandez, 2007).

Effective communication is crucial to the patient's safety and their quality of care. Schyve defines effective communication, as communication that is comprehended by both participants, often bidirectional between participants, and it allows both parties to clarify the intended message (Schyve, 2007). Effective communication cannot occur in the absence of comprehension, and as a result, the provision of health care contains errors, is of poor quality, risks patient safety, or is nonexistent (Schyve, 2007). Schyve explains the triple threat to effective communication that occurs when English only speaking health professionals treat patients with limited English proficiency. The first threat is the language barrier. Often language barriers between patients and health care providers are underestimated (Wilson-Stronks & Galvez, 2007). Secondly, cultural differences are a barrier to communication (Schyve, 2007). Schyve goes on to explain how an individual's culture can have an affect on how they interpret certain words, which could change the meaning of sentences, and ultimately their overall perception of the world. This requires people not just to learn another language, but also to understand another culture, which increases the possibility of either underrating the affects that culture may play or of stereotyping people based on their culture (Schyve, 2007). The third barrier to effective communication is low health literacy (Schyve, 2007).

The most frequent cause of serious adverse events reported to the Joint Commission's sentinel event database is communication problems (Schyve, 2007). The

Joint Commission found that the outcomes are more severe for limited English proficiency patients than in English-speaking patients when patients suffer adverse outcomes from medical errors (Divi, Koss, Schmaltz, & Loeb, 2007, Schyve, 2007). Effective communication is a critical component of health care, and patient rights, quality of care, and patient safety make it an obligation of the health care system (Schyve, 2007).

### **Physician- Patient Communication and Compliance**

Physicians today do not spend the time that is necessary to educate their patients on all of the risks related to hypertension, and they have not done a satisfactory job of expressing the significance of being compliant with specific hypertension regimens daily to their patients (Rapi, 2002). As a result, patients are not knowledgeable of the risks that hypertension comprises or of the disease as a whole (Sanon et al., 2014). According to the eighth edition of the Joint National Committee on Detection, Evaluation, and Treatment of Hypertension, JNC, hypertension rates have continued to decrease over the years in spite of the readily available variety of potent medications (Betancourt, Carrillo, & Green, 2003). One of the most important therapy-limiting factors of hypertension is poor patient compliance (Betancourt et al., 2003). Luscher, Vetter, Siegenthaler, and Vetter discovered that 10 to 15% of hypertensive patients are lost to follow-up, and 20 to 40% of patients comply insufficiently with prescribed antihypertensive therapy (as cited in Betancourt et al., 2003, p. 482).

In 1991, Clark exemplified how nearly 50% of hypertensive patients fail to keep their follow-up appointments and how only 60% adhere to their medications as prescribed. Multicultural and minority populations are more likely to have less insurance

coverage or no insurance coverage at all and struggle with language and literacy barriers, as a result they will be less inclined to seek health care (as cited in Betancourt et al., 2003). It should also be noted that individuals who have health behaviors or beliefs that are different from the standard biomedical health regimen could affect their compliance with the standard level of medical treatment normally provided. Therefore it is important that all members of a racial, social, or ethnic group are not all categorized as noncompliant. Instead, individuals within these groups who have a certain set of socio-cultural centered beliefs, values, and behaviors may be at a greater risk for noncompliance (Pachter & Weller, 1993, Betancourt et al., pg. 483, 2003). In the past, the work done on improving patient compliance has focused on recognizing and eliminating any barriers to communication. Whether the barriers are practical, logistical, or structural. There has been fewer studies conducted on the relationship between compliance as it relates to health care professional's behavior and their delivery of medical care. However, previous research has compared compliance, outcome, and patient satisfaction to physician-patient communication (Miller, Hill, Kottke, & Ockene, 1997, Betancourt et al., 2003, p. 483).

### **Summary**

African Americans have the highest incidence of hypertension, which is the most prevalent chronic disease in the United States and disproportionately affects African Americans, including Haitian immigrants, which makes it the single most frequent offender in morbidity and mortality between African Americans and European Americans (Jones & Hall, 2006). Hypertension can be treated and in turn, reduce

morbidity and mortality associated with cardiovascular related diseases. This literature review addressed the different reasons responsible for hypertension compliance in the Haitian immigrant community, including language barriers, culture and beliefs, patients, health care professionals, and health care systems. Hypertension remains uncontrolled in the Haitian immigrant population due to lack of understanding of the community, its language, and their culture. The Haitian immigrant population is often grouped in with the African American population and as a result misrepresented. This review also addressed the current deficiencies of the United States health care systems to ensure Title IV obligations and language barriers in health care. A better understanding of the Haitian population is needed for health professionals and physicians to effectively communicate with them and overcome patient related barriers to hypertension control; however, the bigger issue rests in the fact that doctors are not ensuring complete comprehension of hypertension to patients in the Haitian immigrant community.

Chapter 3 provides more details on the quantitative method used for this study, research design, data collection procedure, and data analysis used.

## Chapter 3: Research Method

### **Introduction**

The purpose of this study was to assess whether there is an association between hypertension and health literacy amongst the Haitian community, as well as its impact on medical compliance within the community. This chapter includes the study's sampling, methodology regarding the population, a description of the study's research design and rationale, and sampling procedures. An overview of the study's instrumentation and operationalization of constructs and variables are discussed. I will also cover the data collection process and analysis and ethical procedures involved in the study.

### **Research Design and Rationale**

I employed a cross-sectional study design, retrospective data analysis of an annual New York City survey, and the quantitative method of hypotheses testing. The quantitative method was chosen over the qualitative or mixed methods approaches because the quantitative approach allows for the analyzed data to either refute or support the hypotheses of this study. Creswell (2009) defined qualitative research as a situated activity that locates the observer in the world. Therefore, qualitative researchers must study things in their natural settings and attempt to make sense of, or interpret, phenomena concerning the meanings people bring to them (Denzin & Lincoln, 2011). The qualitative approach is appropriate when the researcher is not privy of the relevant variables to examine. When the variables that will be used for the study are known, the quantitative method is used. The mixed-methods approach involves collecting and analyzing both qualitative and quantitative forms of data in a single study (Creswell,



2009). The quantitative method is the best design to accomplish the desired goals of this study. I also chose the cross-sectional study design, which allows the known study variables to be examined and compared to one another. The descriptive study design may have been fitting for this study if the purpose of the study was to describe hypertension rates of Haitian immigrants solely and to explore how U.S. policy and research initiatives could be shaped by the findings. However, I compared the relationship between the variables; as a result, the cross-sectional study design approach was appropriate. The quantitative study method was best because hypothesis testing is used to assess the association amongst the dependent and independent variables. The independent variables of this study were health literacy, sex, income, and education. The dependent variable was hypertension, and the goal was to assess the association amongst these variables, controlling for the confounders (place of birth, age, smoking status, and pregnancy status) elected as a result of the literature review in Chapter 2.

## **Methodology**

### **Population**

The population sample chosen for this study included individuals of New York City over the age of 18 who were randomly selected to participate in the CHS landline telephone survey. From 2010- 2014, there were over 45,000 randomly selected adults selected using a random-digit dialing process, and the data were collected by interviewers who used a questionnaire that was programmed into a computer-assisted telephone interviewing (CATI) system (Kerker & Eisenhower, 2016). New York houses 25% of

the Haitian Immigrant population in the United States, ranking second to Florida (Camarota, 2011).

### **Sampling and Sampling Procedures**

The data for this study consisted of households in New York City that were randomly selected using a list-assisted random digit dialing landline and cell phone sampling frame from 2010 to 2014. One adult, 18 years of age or older, from each household was randomly selected to be interviewed. The data set included the information obtained from the 322 individuals from 2010 to 2014 who responded Haiti to the place of birth question of the survey and who were hypertensive.

### **Sampling Frame**

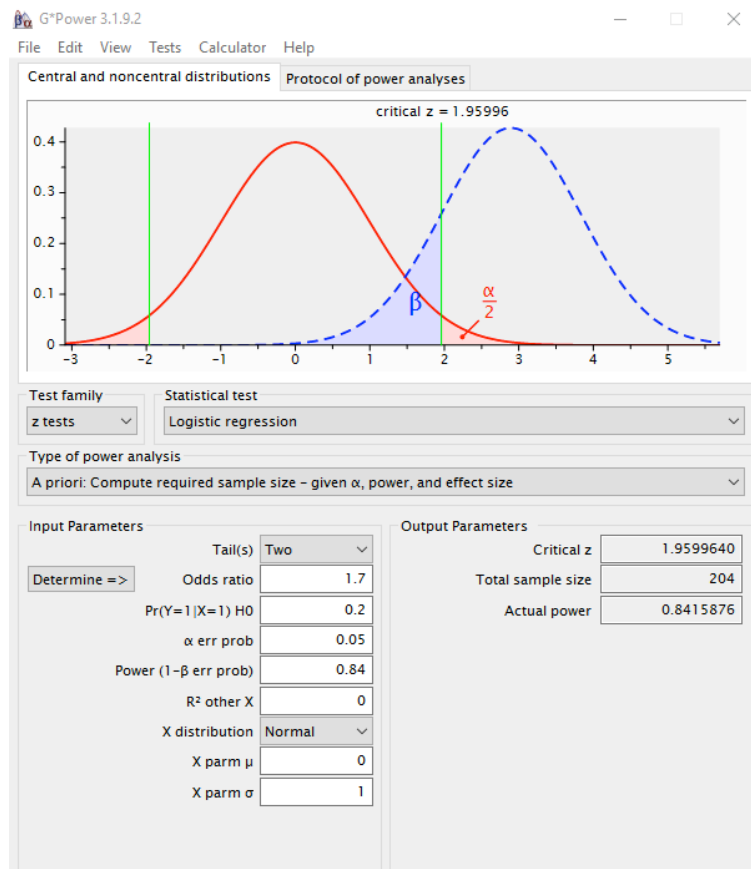
**Inclusion criteria.** All participating subjects were Haitian immigrant adults (18 years or older), who spoke Haitian Creole or English with hypertension and who agreed to participate in the New York City community health survey. I used the information from the survey provided by the participant via the questionnaire to determine the hypertension history, knowledge, and compliance of the study participants. All participants were proficient in the English language enough to be able to give informed consent to participate in the study.

**Exclusion criteria.** Participants were excluded if they declined to participate in the study, withdrew their consent, and were not of Haitian descent or speak Haitian Creole. Adults living in residential facilities, such as group housing or college dorms, were not included. Persons who were mentally impaired, cognitively impaired, or unable to answer survey questions were also excluded. These exclusions did not invalidate the

results of the study because the immigrants from Haiti residing in New York were included in the study.

### Power Analysis

The G\*Power 3.1.9.2 calculator was used to conduct a power analysis to determine the appropriate sample size for this study. A sample of 322 participants over the age of 18 was used in this study. This sample size was selected with the use of the G\*Power 3.1.9.2 calculator. The following selections were made: the logistic regression statistical test, 2 tail testing, an odds ratio of 1.7, a power of 0.84,  $\alpha$  of 0.05, and a normal X distribution. Figure 4 below displays these power analysis input parameters and central and noncentral distribution graph.



*Figure 4.* Power analysis calculation. SOURCE: G\*Power Version 3.1.9.2, Franz Faul, Universitat Kiel, Germany. (1992-2014)

### **Sample Size Determination**

According to the American Community Survey population figures of 2009, approximately, 830,000 people of Haitian ancestry live in the United States (as cited in Buchanan et al., 2010). Further, out of the 830,000 Haitians living in the United States, 191,000 live in New York (Buchanan et al., 2010). New York was a sufficient market to gather information from. Approximately 59% of the population with Haitian ancestry in the United States was foreign-born, and 81% of the population 5 years and older speaks a language other than English at home (Buchanan et al., 2010). This information is vital for the significance of the study.

### **Procedures for Recruitment, Participation, and Data Collection**

The sample selection used was an overlapping sample design. Most of the interviews collected were of New York City adults who were randomly selected from residential households that were contacted using the RDD list-assisted landline telephone sample (New York City Department of Health and Mental Hygiene [NYCDHMH], 2010). The overlap was a result of the additional interviews that came from RDD cellular telephone samples. The 322 individuals who were selected to participate in this study were those who were hypertensive and answered Haiti to the place of birth question. By answering Haiti to the place of birth question, they proved to be immigrants from Haiti residing in New York City. Their answers to survey questions were used for the purpose of this study. The questionnaire responses that were used for the study from the 322

Haitian immigrants on sex, income, education, and health literacy were extracted from the dataset sent to me from NYCHMH. The data were later moved to the Statistical Package for Social Science (SPSS) software from SAS. This switch was necessary in order to ensure better storage, easier data coding, management, and analysis.

### **Instrumentation**

The instrument used for this study was the Community Health Survey Questionnaire, conducted by the New York City Department of Health and Mental Hygiene (DOHMH), from 2010-2014. An example of the 2010 survey questionnaire can be found in Appendix A. A data use agreement between the New York City DOHMH and Walden University was required in order to gain access to the raw data needed to complete this study.

### **Study Variables**

#### **Independent Variable**

**Health literacy.** This was the ability of an individual to obtain, process, and understand basic health care instructions. For this study, language spoken at home was used as a proxy for health literacy.

**Sex.** Sex was examined as a categorical dichotomous variable male (coded as 1) and female (coded as 2). The participants specified their selections on the NYCDHMH questionnaire.

**Income.** Income was measured by comparing the annual household income to the level of poverty (PVTYLVL) and ranked according to the participant's response. It was recorded as a continuous variable with less than 100% (coded as 1), 100-199% (coded as

2), 200-299% (coded as 3), 300-399% (coded as 4), 400-499% (coded as 5), 500-599% (coded as 6), and > 600% (coded as 7).

**Education.** I measured education by the years of attainment at an educational institution. It was recorded as a categorical variable: Never attended school or only attended kindergarten (coded as 1), Grades 1 through 8 (ELEMENTARY) (coded as 2), Grades 9 through 11 (SOME HIGH SCHOOL) (coded as 3), Grade 12 or GED (HIGH SCHOOL GRADUATE) (coded as 4), college 1 year to 3 years (SOME COLLEGE OR TECHNICAL SCHOOL) (coded as 5), or college 4 years or more (COLLEGE GRADUATE) (coded as 6).

### **Dependent Variables**

**Hypertension self-management.** A dependent variable is the subject of measurement, and its value is determined by other variables known as independent variables. The dependent variable in this study was hypertension self-management. Hypertension self-management was measured by regular use of medication and cutting down on foods high in salt. Hypertension was used as a selection criterion and was defined as having a blood pressure of 140mm Hg or above and/or a diastolic blood pressure of 90 mm HG or above (AHA, 2016). The individuals who participated in the study disclosed their hypertension history in the blood pressure section of the NYCDHMH questionnaire. The individuals who answered yes to the first question were defined as having hypertension. The questions were the following:

1. Have you ever been told by a doctor, nurse, or other health professional that you have hypertension, also called high blood pressure? (Coded as yes-1, no-2, don't know/ not sure- 3 and refused-9)
2. Have you ever been told by a doctor, nurse, or other health professional that you need to take medicine for your high blood pressure? (Coded as yes-1, no-2, don't know/ not sure- 3 and refused-9)
3. Are you currently taking medication for your high blood pressure? (Coded as yes-1, no-2, don't know/ not sure- 3 and refused-9)
4. Are you cutting down on salt to help lower or control your high blood pressure or prevent high blood pressure? (Coded as yes-1, no-2, do not use salt-3, don't know/not sure – 7, and refused – 9)

### **Covariates**

Based on the literature review of this study, probable covariates were smoking status, age, and place of birth. The covariates age, smoking status, and place of birth were addressed in this study to conclude the true impact of the independent variables (health literacy, sex, income, and education) on the dependent variable (hypertension). The participants of the study specified details on these covariates while responding to the questions in the survey.

**Age.** Age was defined as 18 years and older at the time of the study. This information was extracted from the demographic data of the questionnaire. Age was assessed as an interval variable within this study. Age was defined in categorical groups

of years from 65 or older (coded as 1), 45-64 (coded as 2), 25-44 (coded as 3), and 18-24 (coded as 4).

**Smoking.** This information was obtained from the NYCDHMH questionnaire. Participants were required to answer questions about their smoking habits. Their responses were recorded as a dichotomous variable: yes (coded as 1) or no (coded as 2).

**Place of birth.** This information was obtained from the NYCDHMH questionnaire. The individuals were required to answer the place of birth question. Their response were recorded as a dichotomous variable United States (coded as 1) or outside of United States (coded as 2), then categorized further into states within the United States or a country (Appendix A).

### **Data Analysis Plan**

Weight was applied to each record to analyze community health survey (CHS) data appropriately. The weight consisted of an adjustment for the probability of selection (number of adults in each household/number of residential telephone lines), as well as a poststratification weight (NYC, 2016). The poststratification weights were created by weighing each record up to the population of the united hospital fund's neighborhood while taking into account the respondent's age, gender, and race (NYC, 2016). As a result of the weights that were applied to the dataset the statistical software for analyzing correlated data, SUDAAN were used to analyze the data. SUDAAN was designed and developed by RTI International (RTI). Its procedures accurately account for correlated observations, clustering, weighting, stratification, and other complex design features, which makes it appropriate for accurately analyzing the survey data within this study



(RTI, 2016). All of the data analysis in this study was conducted using this software. Previous researchers have used logistic regression as the prime analytical technique for analyzing datasets of alternate research on chronic diseases and health literacy (DeWaltz et al., 2006; Morris et al., 2006). Regression analysis is a technique that can be used to describe the association between one or more independent variables and the dependent variable in a dataset (Stolzenberg, 2004). This study included more than one independent variable; therefore, multiple regression analysis was used to analyze the data.

### **Threats to Validity**

#### **Internal Validity**

Internal validity computes the level of changing the independent variable causes towards the dependent variable (Trochim & Donnelly, 2008). The purpose of this study was to explore the association amongst hypertension and health literacy in the Haitian immigrant community and their medical compliance. As a result of a lack of causality, there was no significant threat to internal validity within this study. Confounding is a threat to internal validity because it can exaggerate the real association between variables (Pannucci & Wilkins, 2010). The confounding variables within this study had a potent effect on the cause of the dependent variable. These variables could be either a covariant or alternative cause to affect the dependent variable. Another possible threat to internal validity was interviewer bias due to the nature of the NYCDHMH telephone survey. Interviewer bias refers to a systematic difference between how information is perceived recorded or interpreted (Pannucci & Wilkins, 2010). This may have occurred when the research collectors were capturing the data and had to make a presumption on the

participant's response as a result of a language barrier that was not disclosed due to embarrassment on the participants' part. To preserve the validity of any study, renowned data collection techniques should be practiced (Babbie, 2007). Thus, IBM SPSS statistics was used to extract and analyze the data.

### **External Validity**

External validity deals with the degree to which findings can be generalized to other populations (Pannucci & Wilkins, 2010). The technique used for the sample selection was a significant threat to external validity. A list-assisted random digit dialing landline and cell phone sampling frame in which one adult, 18 years of age or older, from each household was randomly selected to be interviewed for the NYCDHMH. Furthermore, only those who replied Haiti to the place of birth question were used for this study. The NYCDHMH takes place in New York City, which is home to the second largest Haitian immigrant population in the United States. The absence of randomization when selecting the Haitian immigrants for this study, along with all of the other factors mentioned above, limit the associations that can be made with the conclusions of this research to communities similar to the study's sample population.

### **Ethical Issues**

Ethics can be described as a method, procedure, or perspective for deciding how to act and for analyzing complex problems and issues (Resnik, 2011). The NYCDHMH study involved human subjects who willingly agreed to participate in a computer-assisted telephone-based survey. They voluntarily agreed to participate in the study, provided informed consent; their information was kept confidential, and their identity remains

anonymous. All of the data and information that I received from the NYCDHMH study were done so after completing a data use agreement between Walden University and NYCDHMH. Once the agreement was in place, the data were sent over and were saved on an external, password-protected hard drive. Trust, accountability, mutual respect, and fairness are some of the values that are essential to collaborative work that ethical standards promote (Resnik, 2011). Honesty when recording the discoveries of the research, including the difficulties a researcher may have experienced while conducting the study, may help save future researchers from experiencing the same challenges

### **Protection of Human Participants**

Human subject's research is defined as research involving a living individual about whom an investigator obtains either data through interaction or identifiable, private information (National Institute of Health, 2016). This study was done retrospectively, and there were no personal or private participant information shared between Inter-university Consortium for Political Social Research and myself. All of the data collected in the community health survey was self-reported, and the participants willingly conducted the survey. There was no incentive provided for completing the study. The community health survey study is conducted annually, and the information obtained in the study is used to understand the health and risk behaviors of New Yorkers better and to track key indicators over time (New York City Health, 2016). The protection of human participants was not an issue within the community health survey study nor was it a problem in this study.

## Summary

This chapter details the methodology, research design and rationale, quantitative method, and instrumentation that were used to assess the research questions and the hypotheses for this study as they relate to health literacy and medical compliance in hypertensive Haitian immigrants. The study variables and potential covariates were defined. Potential threats to external and internal validity and how to minimize them are covered in this chapter. Also described, in this chapter, are the ethical issues and the measures used to ensure the protection of human participants. Lastly, the data analysis, management, and storage plan were discussed in this chapter.

Chapter 4 will provide a more in-depth look at the data collection and analysis used to examine the research questions of this study, and the results of the statistical tests that were conducted.

## Chapter 4: Results

### Introduction

The purpose of this study was to use a quantitative study to examine the association, if any, between hypertension and health literacy in hypertensive Haitian immigrants in the United States. A cross-sectional study design was used. The research questions and hypotheses that guided this study were the following:

RQ1: Is there an association between health literacy, as measured by primary language spoken in the home (Creole vs. English), and hypertension self-management, as measured by regular use of medication and cutting down on foods high in salt?

$H_{01a}$ : There is no association between health literacy as measured by primary language spoken in the home (Creole vs. English) and hypertension self-management as measured by regular use of medication.

$H_{11a}$ : There is an association between health literacy as measured by primary language spoken in the home (Creole vs. English) and hypertension self-management as measured by regular use of medication.

$H_{01b}$ : There is no association between health literacy as measured by primary language spoken in the home (Creole vs. English) and hypertension self-management as measured by cutting down on foods high in salt.

$H_{11b}$ : There is an association between health literacy as measured by primary language spoken in the home (Creole vs. English) and hypertension self-management as measured by cutting down on foods high in salt.

RQ2: Is the association between health literacy, as measured by primary language spoken in the home (Creole vs. English), and hypertension self-management, as measured by regular use of medication and cutting down on foods high in salt affected by gender?

*H<sub>0</sub>2a*: There is no association between health literacy as measured by primary language spoken in the home (Creole vs. English) and hypertension self-management as measured by regular use of medication and gender.

*H<sub>1</sub>2a*: There is an association between health literacy as measured by primary language spoken in the home (Creole vs. English) and hypertension self-management as measured by regular use of medication and gender.

*H<sub>0</sub>2b*: There is no association between health literacy as measured by primary language spoken in the home (Creole vs. English) and hypertension self-management as measured by cutting down on foods high in salt and gender.

*H<sub>1</sub>2b*: There is an association between health literacy as measured by primary language spoken in the home (Creole vs. English) and hypertension self-management as measured by cutting down on foods high in salt and gender.

RQ3: Is the association between health literacy, as measured by primary language spoken in the home (Creole vs. English), and hypertension self-management, as measured by regular use of medication and cutting down on foods high in salt affected by annual household income?

*H<sub>0</sub>3a*: There is no association between health literacy, as measured by primary language spoken in the home (Creole vs. English), and hypertension self-management, as measured by regular use of medication and annual household income.

*H<sub>1</sub>3a*: There is an association between health literacy, as measured by primary language spoken in the home (Creole vs. English), and hypertension self-management, as measured by regular use of medication and annual household income.

*H<sub>0</sub>3b*: There is no association between health literacy, as measured by primary language spoken in the home (Creole vs. English), and hypertension self-management, as measured by cutting down on foods high in salt and annual household income.

*H<sub>1</sub>3b*: There is an association between health literacy as measured by primary language spoken in the home (Creole vs. English) and hypertension self-management as measured by cutting down on foods high in salt and annual household income.

RQ4: Is the association between health literacy, as measured by primary language spoken in the home (Creole vs. English), and hypertension self-management, as measured by regular use of medication and cutting down on foods high in salt affected by education?

*H<sub>0</sub>4a*: There is no association between health literacy as measured by primary language spoken in the home (Creole vs. English) and hypertension self-management as measured by regular use of medication and education.

*H<sub>1</sub>4a*: There is an association between health literacy as measured by primary language spoken in the home (Creole vs. English) and hypertension self-management as measured by regular use of medication and education.

*H<sub>0</sub>4b*: There is no association between health literacy, as measured by primary language spoken in the home (Creole vs. English), and hypertension self-management, as measured by cutting down on foods high in salt and education.

*H<sub>1</sub>4b*: There is an association between health literacy, as measured by primary language spoken in the home (Creole vs. English), and hypertension self-management, as measured by cutting down on foods high in salt and education.

In this chapter, I will examine the sample population, data, and the data collection technique used to complete the study. I also give an account of the statistical evaluations that were adopted to translate the statistics and the responses to all five of the research questions in the study.

### **Changes in Methodology**

Although there were a couple of changes, data collection practices for the research occurred as explained in Chapter 3. The NYCDHMH's IRB requested that specific weights for the survey years that each question was asked in be used, and that I include the entire dataset in the analyses, rather than extracting only the Haitian-born respondents. However, weights were not applied in this study for the following reasons: prevalence estimates were reported, and the extracted sample meeting the dependent criteria was rather small, as seen in the Table 1 case processing summary. As a result, there was a high likelihood of biasing the sample selection due to the rigorous Boolean logic that was applied, and most of the variables were dichotomies in the study. Also, for the dependent variable, I created a cluster factor using the individuals who responded yes to the following variables: *toldhighbp*, *toldprescription*, *takingmeds*, *takingbpmedsall*,



reducesalt, or changedmindsalt, to determine which individuals in the study had a high propensity for hypertension as seen in the Table 2 classification table. These modifications do not appear to have meaningfully impacted the results of the study.

Table 1

*Case Processing Summary*

Unweighted Cases		<i>N</i>	Percent
Selected Cases	Included in Analysis	318	98.8
	Missing Cases	4	1.2
	Total	322	100.0
Unselected Cases		0	.0
Total		322	100.0

*Note.* If weight is in effect, see classification table for the total number of cases.

Table 2

*Classification Table*

		Predicted			
		Respondents having a high propensity of Hypertension-Computed			
	Observed	.00	1.00	Percentage Correct	
Step 1	Respondents having a high propensity of Hypertension-Computed	.00	281	0	100.0
		1.00	36	1	2.7
Overall Percentage`					88.7

Data collection transpired over a period of 5 years, from 2010 to 2014. After completing a data use agreement between the NYCDHMH and Walden University, I was

able to obtain the raw data set. The NYCHMH created a raw data set for this study to include only the variables included in this study. There were a total of 45,514 respondents who completed the survey. The population data set was used to construct a dependent variable labeled, “Respondents having a high propensity of Hypertension” among Haitian born residents. This variable was computed by using the following questions from the surveys:

1. Ever told by a doctor, nurse, or other health professional you have hypertension, also called high blood pressure? - COMPOSITE
2. Are you currently taking medication for your high BP? (among ever told high bp) - COMPOSITE
3. Ever told to take meds for high blood pressure (among ever told high bp) - COMPOSITE
4. Are you cutting down on salt to help: Lower or control high BP OR prevent high BP? – COMPOSITE

I applied a Boolean logic to create the dependent variable group with the individuals who replied yes to all of the above questions with the use of and as an operator. There were 318 Haitian immigrant cases included in the study; however, the dependent variable set contained 36 cases. There were only 36 respondents who qualified as Haitian immigrants with a relatively high propensity of hypertension, as compared to the other 281 individuals. The records were coded as 1 for the dependent group and 0 for the independent group cases.

### **Descriptive and Demographic Characteristics of the Sample**

Descriptive statistics for the sample population ( $N=322$ ) are presented in Table 3.

Table 3 shows the independent variables and their relative contribution to explain the dependent variable classification. Variable(s) entered on step 1: Age group in years, Male or female, educational status, What is the highest grade or year of school you completed?, English - language spoken most often at home - composite, Creole - language spoken most often at home -(other assumed as Creole -composite), participate in physical activities or exercises -composite, insured - created from the gateway question - composite, current or former smoker - computed, household income as percentage of federal poverty guidelines (variable poverty group with imputation of missing cases). Table 3 also displays the B-value, standard error, Wald test, degrees of freedom, significance, and exponentiation of the B coefficient for the independent variables used in the equation (health literacy, sex, income, and education), the dependent variable (hypertension self-management), and covariates (age, smoking status, and place of birth). Lastly, Table 3 shows how the logistic regression statistical method was applied to formulate the dependent variable, labeled, “Respondents having a high propensity of Hypertension” among Haitian-born residents using several questions from the survey and a Boolean logic. A logistic regression was used to analyze the data.

Table 3

*Composition of Study Sample in Percentage (N = 322)*

Variables	Frequency	Percent
<b>Gender</b>		
Male	118	36.6
Female	204	63.4
<b>Age Group in Years</b>		
18-24 yrs	18	5.6
25-44 yrs	132	41.0
45-64 yrs	133	41.3
65+ yrs	39	12.1
<b>Educational Status</b>		
Less than High School	24	7.5
High School Graduate	82	25.5
Some College	97	30.1
College Graduate	115	35.7
<b>Smoking Status</b>		
Never	277	86.0
Current	16	5.0
Former	29	9.0
<b>Insured/Uninsured</b>		
Yes	64	19.9
No	15	4.7
<b>Language Spoken Most Often At Home</b>		
English	37	11.5
Other	38	11.8
<b>Household Income as % of Federal Poverty Guidelines</b>		
<100% FPL	33	10.2
100 - <200% FPL	38	11.8
200 - <400% FPL	32	9.9
400 - <600% FPL	28	8.7
≥600% FPL	15	4.7

### **Variable in the Equation**

As noted in Table 4, there were certain variables that had a statistically significant impact on the dependent variable, denoted by the *P (Sig)* estimates. The propensity of hypertension was more visible in higher age groups as seen in the *p*-value of .007; females had a higher propensity as seen in this study with a *p*-value of .085, and in households with higher poverty levels that had a *p*-value of .009. Neither of the two languages spoken at home, English nor Creole, had a significant level of correlation with the propensity of hypertension. There was a slight change in the Beta value observed in the Creole group compared to the English group (.289 vs. -.139), but not statistically significant enough to draw a valid comparative conclusion. Health insurance did not have any impact on the propensity of hypertension. However, the data does call for priority to health literacy. The Beta value shows that people who tend to speak English at home have a better understanding of health literacy. The English Beta value was -.139 and the Creole was .289; this higher Beta value signified that if the individual knows better English, that there was a better probability that they will maintain their health and stay away from hypertension.

Table 4

*Variables in the Equation (N=322)*

	<i>B</i>	<i>SE</i>	Wald	<i>df</i>	Sig.	Exp(B)
Age group in years	.701	.258	7.364	1	.007	2.015
Male or female	.779	.453	2.958	1	.085	2.180
Educational status	-1.873	1.375	1.855	1	.173	.154
What is the highest grade or year of school you completed?	1.487	1.296	1.316	1	.251	4.422
English - language spoken most often at home – COMPOSITE	-.139	1.115	.016	1	.901	.870
Creole - language spoken most often at home - (OTHER assumed as Creole -COMPOSITE)	.289	1.114	.067	1	.795	1.335
Participate in physical activities or exercises – COMPOSITE	-.088	.393	.050	1	.823	.916
Insured - created from the gateway question – COMPOSITE	.461	.531	.754	1	.385	1.585
Current or Former Smoker – Computed	.178	.568	.098	1	.754	1.195
Household income as % of Federal poverty guidelines (variable povertygroup with imputation of missing cases)	.608	.233	6.823	1	.009	1.836
Constant	-9.462	3.258	8.434	1	.004	.000

## Results

Logistic regression is the most used statistical technique for predicting classification of dependent variables coded as a Boolean value such as True, False or 0,1. Everything was a dichotomy in this logistical regression, so all of the variables were either 0 or 1. Independent variables language and sex were in the same 0,1 coding; however, age group, education status, and poverty level were classified as ordinal variables. Table 5 shows the model summary.

Table 5

*Model Summary of Study Sample (N=318)*

Model Summary			
Step	-2 Log likelihood	Cox& Snell R Square	Nagelkerke R Square
1	204.594	.073	.142

Estimation terminated at iteration number 6 because parameter estimates changed by less than .001.

I examined the two pseudo-R-squared statistics, which can be interpreted similarly to that of multiple linear regressions. The main difference between the Cox & Snell R Square measurement and the Nagelkerke R Square measurement is that the former produces more conservative pseudo R squares than the latter. Based on the variance explanation, it is safe to conclude that the independent variables were capable of only explaining about 15% of the variances in the likelihood of a respondent to be classified in the Hypertension group or the other segment of the dichotomy.

### Summary

As evidenced in Table 4, certain variables seem to have a statistically significant impact on the dependent variable, denoted by the *P (Sig)* estimates.

1. As one can expect, the propensity of hypertension is more visible in higher age groups.
2. Females seem to have a higher probability of classification of hypertension than males. This information correlates with previous studies and the belief that women have certain things that put them at a higher risk of developing hypertension more than men.

3. Higher poverty level appears to be a contributing factor to hypertension. There are other prevailing reasons for this incidence, well documented in the literature review of chapter 2.
4. English spoken at home did not correlate at a significant level with hypertension.
5. Creole spoken at home did not correlate at a significant level with hypertension. Unfortunately, the question did not contain an option for the Creole Language. Thus, the OTHER category in the Language Spoken at home question was used for individuals classified in the Haitian-born population. OTHER was assumed to be reflective of Creole, as it is the country of Haiti's native language. A slight change in the Beta value was observed in the Creole group as compared to English (.289 vs. -.139), but not statistically significant to draw a valid comparative conclusion. While this might be a noteworthy finding from the standpoint of health literacy, without additional data and granularity, further inferences are not within the scope of these results.
6. Having health insurance did not seem to have any impact on hypertension, at least in this study. The finding, however, calls for priority to Health Literacy programs among the higher poverty-stricken and under-served groups. That has also been well documented in the national and international literature.



The vital discoveries of this analysis will be evaluated and explored in the perspective of the theoretical framework for this study, second language acquisition theory, in Chapter 5. Also, in Chapter 5, recommendations for future research and the restrictions to the generalizability of the outcomes of this research study will be made.

## Chapter 5: Discussion, Conclusions, and Recommendations

### Introduction

This was a cross-sectional study to examine whether the language that is used to deliver the hypertension diagnosis to the Haitian population has an impact on their medical compliance. Once the logistic regression analysis for the study was completed, information was postulated that concluded in the rejection of the null hypotheses ( $H_{03a}$ ,  $H_{03b}$ ) in favor of the alternative hypotheses ( $H_{13a}$ ,  $H_{13b}$ ) of Research Question 3.

The logistic regression analysis of the study also rendered evidence that failed to reject the null hypotheses ( $H_{01a}$ ,  $H_{02a}$ ,  $H_{04a}$ ,  $H_{01b}$ ,  $H_{02b}$ ,  $H_{04b}$ ) and not accept the alternative hypotheses ( $H_{11a}$ ,  $H_{12a}$ ,  $H_{14a}$ ,  $H_{11b}$ ,  $H_{12b}$ ,  $H_{14b}$ ) of Research Questions 1, 2, and 4 respectively.

### Interpretation of Findings

I assessed the connection between the language used to deliver the hypertension diagnosis to the Haitian population using the variables (sex, income, and education level amongst Haitian Adults living in New York) and comparing them in relation to the primary language spoken at home (English or Creole). The results of this research supported the discoveries of many other researchers (Baker et al., 2007; Muir, Christensen, & Bosworth, 2013; Omachi, Sarkar, Yelin, Blanc, & Katz, 2013) that there is an association amid poor health outcomes and low health literacy. Nevertheless, the results of this study on the basis of the logistic regression statistical analysis showed that the relationship between language spoken at home and hypertensive medical compliance in the Haitian immigrant population residing in New York was not a statistically

significant relationship, (Table 3) and implied that the other variables included in the study (age, gender, household income, and education) had more of an influence on the level of hypertension witnessed in the participants. A number of studies (Ambaw, Alemie, Yohannes, & Mengesha, 2012; Appel, Brands, Daniels, Karanja, Elmer, & Sacks, 2006; Ndumele, Shaykevich, Williams, & Hicks 2010) have shown that factors such as compliance with antihypertensive medication prescribed, physician visits, low salt diets, alcohol consumption, income, marital status, the level of physical activity, and the presence of comorbidities influence hypertension results and may have had an influence in the levels of hypertension seen in the participants of this study.

Ambaw et al. (2012) conducted a study of 384 patients from a hospital in the northwest region of Ethiopia and concluded that individuals who resided farther from the university hospital and who had access to care were single and had more than one comorbidity including hypertension, adhered less to their hypertensive treatment regimens and experienced more uncontrolled levels of hypertension. Ndumele et al. (2010) also concluded that noncompliance with physician-administered hypertensive medication, not adhering to follow-up hospital visits with their physicians, and poor diet resulted in reduced hypertension management in the African American patients when paralleled to the outcomes of European Americans within the same study. Appel et al. (2006) claimed that reduced alcohol and salt intake and high levels of physical activity resulted in weight loss to manage high blood pressure. These studies illustrated that there are numerous factors (marital status, alcohol consumption, and noncompliance with

physician visits) and other elements not evaluated in this study that could also have an influence on the level of hypertension observed in patients.

The theoretical framework for this study, second language acquisition theory, founded by Krashan, was expanded the theory into five different hypotheses: the acquisition-learning hypothesis, the natural order hypothesis, the monitor hypothesis, the comprehension hypothesis, and the affective filter hypothesis. The comprehension hypothesis, which answers the question of how language is acquired, is the centerpiece of the language acquisition theory. People acquire language and develop literacy when they understand messages, or when they understand what they hear and what they read when they receive comprehensible input (Krashen, 2003). It refers to the subconscious acquisition, not conscious learning, and has a written and verbal aspect (Krashen, 2004). Language acquisitions occur when individuals understand messages and do so without their conscious awareness (Krashen, 2010). In the context of this study, individuals who acquired English as a second language and were delivered the diagnosis and medical regimen information for hypertension in English as opposed to Creole, were less likely to adhere to their hypertensive medical regimens or understand the severity of the disease due to a lack of understanding.

I found that there was no relationship between Creole or English, the variables used to represent health literacy, and the propensity of hypertension. However, as noted in Table 4, there was a slight change in the Beta value observed in the Creole group compared to the English group (.289 vs. -.139), but not statistically significant enough to draw a valid comparative conclusion. Gender, household income, and education had

more of an influence on the Haitian population's medical compliance than health literacy. Applying the constructs of the second language acquisition theory to rationalize, it could be determined that although the English and Creole variables did not correlate at a significant level with hypertension, individuals who speak two languages at home are more likely to use the language that they acquired rather than the language that they learned. Therefore, these Haitian immigrants residing in New York who received their initial diagnosis of hypertension in English may not have suitable knowledge of their diagnosis for them to recognize the urgency of this deadly illness and the consequences of adhering to the medical regimen given by the physician on that particular initial visit. Ultimately, health literacy may be associated to many aspects of the second Language acquisition theory, so additional research would be required to better establish which aspect is most likely to foresee its relationship with health literacy.

### **Implications for Social Change**

According to the DHHS (2010), health literacy is defined as the degree to which individuals can obtain, process, and understand basic health information and services needed to make appropriate health decisions. However, this definition has evolved to include the ability of a patient to obtain the skills necessary to be able to incorporate health, education, cultural, and social influences into his or her decision making (Jordan, Buchbinder, & Osborne, 2010). There are a number of assessments used to determine an individual's health literacy; however, studies show that there is no effective testing tool extensive enough to embody the evaluation of an individual's assertiveness, verbal communication skills, ability to process, retain, and eventually apply that understanding

to refining their health and literacy skills (Jordan et al., 2010). Kreps and Sparks (2008) determined that immigrants often struggle with health literacy and language barriers, which are made worst by socioeconomical and cultural barriers of accessing and comprehending applicable health information. Kreps and Sparks suggested the development of detailed communication procedures to properly influence and relate to these communities to help promote public health and eliminate health disparities. People who are determined to have low health literacy are more inclined to smoke, use illegal substances, alcohol abuse, and have a sedentary lifestyle (Lee, Arozullah, & Cho, 2004). As a result, it is important that individuals have the appropriate health literacy skills to assume responsibility for their health care needs.

Social change implications from the conclusions of this study include the need for health care staff responsible for the initial diagnosis of hypertension to be aware of the roles that age, gender, income, and education may play in regards to health literacy or the understanding of the hypertensive diagnosis. It is their responsibility to understand that the information they are giving must be modified for the present patient. Furthermore, an improved method of delivering initial diagnoses of chronic diseases, such as hypertension, that includes a translator being present could help increase the number of individuals who not only understand their diagnosis but also follow the medical regimen.

### **Limitations of the Study**

Based off of the statistics, the results of this study were insignificant regarding the association between health literacy, measured as language spoken at home, and its effects on the initial diagnosis of hypertension and medical compliance and this may be due to

several limitations. Although English was listed as an option, the survey administered to the New York city citizens did not list Creole as an option for the question “What is the primary language spoken at home?” Therefore for those who selected Haiti as a place of birth and were deemed Haitian immigrants, “OTHER” was selected and inferred as the selection Creole. The  $P$  (*Sig*) for English was .901 and for Creole was .795 neither of which is statistically significant enough to draw a valid comparative conclusion. A slight change in the Beta value was observed in the Creole group as compared to English (.289 vs. -.139), yet this too was not significant enough to help accept or reject the null or alternative hypotheses. While this might be a noteworthy finding from the standpoint of health literacy, without additional data and granularity, additional insinuations are not within the capacity of these results.

Data collection for this study occurred from 2010-2014. The NYCDHMH created a special data set for this particular study that consisted of all of the questions and variables required to complete this study. This data set consisted of a total of 45,514 respondents, of which only 322 were Haitian immigrant cases that could be included in the study. After the Boolean logic was created there were a total of 36 cases that qualified with a high propensity of hypertension. There were also some limitations to the generalizability of the results of the study, including the urban setting in which the initial survey was conducted and the inclusion of only Haitian immigrants, which concluded in the omission of other cultural populations.

The focus of this study was on Haitian immigrants who spoke English, Creole, or both. The survey itself was conducted in English and consisted of individuals who were

proficient enough in the English language to be able to give informed consent, to participate in the study. This may have contributed to mistakes in the details provided by participants since the surveys themselves were only available in English. This study also included a response bias, because Haitians who were illiterate in the English language did not partake in the study. This could be perceived as a cause of limitation to the study. The study was also not able to apprehend an important component of the anticipated study population, Haitian immigrants who speak Creole as a primary language at home, who may have opted not to participate in the study, which may have contributed to a discrepancy in how low health literacy, is associated to medical compliance.

The study design itself is also a limitation to the study. According to Babbie (2007), cross-sectional study designs will not generate results that display cause and effect if they allow data to be collected at a precise moment in history. This study included data that was provided by individuals who participated in an annual survey. Therefore recall bias, and the assumption that individuals provided both truthful and accurate responses to the questions within the study are bases for another set of limitations within this study. The responses may have been inaccurate and as a result changed the overall outcome of the statistical analysis performed for the study via the ordinal logistic regression data analysis. This in turn may have lead to the discrepancies and the insignificant statistics association with health literacy and medical compliance observed in the study.



### **Recommendations**

In order to overcome a few of the limitations within this study in future research, I would advise conducting a similar cross-sectional study to the one conducted that examines the association between health literacy and medical compliance using a survey comparable to the one used for this study, but that is administered in Creole and offered to every adult in the household. I believe that this may allow the study to include more participants and could help ensure greater accuracy in responses as participants may be more inclined to participate and share truthful answers as opposed to what they think you want to hear. A study conducted in the primary language of any population of immigrants could ultimately help the surveyor acquire the trust of the participants, which in turn may help solidify the validity of the responses.

The NYCDHMH surveyed to gather information from a very diverse community. In the future, I think they should consider incorporating a health literacy assessment tool as a part of their survey. There are a number of different options available including MART (medical achievement reading test), HALS (health activities literacy scale), and STOFHLA (short test of functional health literacy), all of which can be used to help determine an individual's capability of reading and comprehending clinical information. This information along with the survey responses will help researchers and physicians gain a better understanding of the source of medical noncompliance.

Alternatively, a qualitative study in the future on health literacy and hypertension medical compliance could render valuable results. A qualitative study would allow the researcher to observe the reality of a language barrier and health literacy in a patient's

natural setting (Amaratunga, Baldry, Sarshar, & Newton, 2002). Qualitative research allows for a more intense study design that allows the researcher to obtain more of an everyday reflection of the life of a patient or group of people being observed (Amaratunga et al., 2002). I believe the initial research conducted on health literacy in the future should be conducted more qualitatively to help paint a more vivid picture of the health care setting of these patients to set up the researcher for a more powerful quantitative study.

Lastly, the role that culture plays in the health care decision-making process for Haitian immigrants should also be considered as a covariant in future research studies on health literacy and hypertension medical compliance of this population. An important cultural feature is the tendency for Haitian's to seek direction and advice from their mothers about health care decisions (Pierre, 2012). Another cultural belief, which may also have an impact on the health outcomes for Haitians, is that some ailments are a result of an imbalance with nature, and the use of home remedies such as oils and herbal teas are often used as the first source of treatment (Pierre, 2012). Therefore based on the implications of the findings in these studies future studies on the Haitian community should evaluate the cultural factors examined in this section for their potential effects on health literacy and hypertension noncompliance.

### **Conclusion**

Health literacy is a term that was introduced in the 1970s, which has acquired increasing importance in public health and health care (Sorensen et al., 2012). Individuals with low health literacy are a threat to the health and well being of others

around them and the communities they reside in (Carmona, 2003). Health literacy was used to define the language barrier between physician and patient in this particular study. Although the results of this research did not demonstrate a relationship between health literacy and hypertensive medical compliance that is statistically significant, as civilians of the United States of America, Haitian immigrants must assume accountability for their health in our present health care system (McCray, 2005). They are required to navigate through a wide range of information, including therapeutic instructions, prescriptions, insurance forms, bills, and patient education materials in a time where the health care system is rapidly growing and becoming more complex technologically (McCray, 2005). Therefore, it is imperative that all health care workers make every effort to guarantee that every patient is given all of the necessary and required information to make an informed health decision. To ensure that this occurs it is the responsibility of the health care professional to identify the health literacy level of every patient. This will require successful doctor-patient communication, which will ultimately help patient medical adherence and compliance to medical regimens (McCray, 2005). All of which may decrease health care costs, use of health care services, rates of hospitalization, and increase the use of screening and other procedures. Intuitively on an individual level, it could help patients obtain an adequate level of health literacy, providing them an opportunity to have the proper understanding of disease processes, comprehension of advice and instructions, health beliefs that coincide with their care, and better problem-solving skills to guarantee themselves the best health care.

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