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Walden University

College of Social and Behavioral Sciences

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Dona S. Walcott

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Walden University
2019

Abstract

Cultural Health Beliefs and Influenza Vaccination

Among Caribbean–Born Students

by

Dona S. Walcott

MPH, Florida International University, 1997

BA, University of South Florida, 1990

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Psychology

Walden University

May 2019

Abstract

This purpose of this quantitative study was to examine health beliefs among Caribbean-born university students regarding acceptance or rejection of influenza vaccination among populations at institutions of higher education. In addition, acculturation was addressed as a factor affecting cultural health beliefs. A survey was completed by 98 students enrolled at Florida International University during the spring 2018 semester. Linear regression was used to analyze whether cultural health beliefs and acculturation were predictive of beliefs about influenza vaccination and beliefs about perceived barriers to influenza vaccination. The study findings showed cultural health beliefs of the students were statistically significant predictors of their beliefs about influenza vaccination and perceived barriers to influenza vaccination. Also, the levels of acculturation were a statistically significant predictor of students' cultural health beliefs and beliefs about perceived barriers to influenza vaccination. After 5+ years of acculturation in the United States, the students surveyed still held cultural beliefs and perceived barriers to influenza vaccination that contributed to their lack of acceptance of the vaccination. The information gained from this study gives credence to the need for designing health interventions and health messages on influenza vaccination that are culture specific for a college-age population if influenza vaccination acceptance is to be promoted.

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Dedication

I dedicate my dissertation to my parents for instilling in me the value of an education and the persistence to pursue one, with special dedication to my dad, Elmer Walcott, who has been my biggest champion. I dedicate my dissertation to my children, Khemaron and Breana for understanding why their mom spent so many nights and years of their lives studying, but they never stopped supporting me. Finally, I dedicate my dissertation to myself for investing my mind, heart and soul for 12 long years.

Acknowledgments

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Chapter 1: Introduction

Background

The intersection of culture and influenza among ethnically-diverse populations has not been fully understood, which has created a public health concern regarding antecedents contributing to the transmission of viral diseases, such as influenza, and understanding of the cultural dynamics within these populations that affect their decisions about influenza (Adonis-Rizzo & Jett, 2006; Seale, Mak, Razee, & MacIntyre, 2012; Shahrabani & Benzion, 2012; Todorova, 2014). Since the 2009 H1N1 influenza outbreak, interest has developed regarding the decisions of individuals, such as those at institutions of higher education (IHE), pertaining to acceptance or rejection of the influenza vaccination. The infection rate ranged from 9-48% among students during influenza outbreaks on university campuses (Poehling, Blocker, Ip, Peters, & Wolfson, 2012). These institutions are densely populated settings conducive to the spread of disease and warranted the Centers for Disease Control and Prevention (CDC, 2009) to issue a technical report on *CDC Guidance for Responses to Influenza for Institutions of Higher Education During the 2009-2010 Academic Year.* The CDC (2009) expanded upon previous recommendations to vaccinate students at IHEs to prevent severe influenza spread and minimize academic disruption. University students from Caribbean regions were addressed in this study because their beliefs about vaccinations can be a source of controversy due to the cultural beliefs associated with their rejection of influenza vaccination. These students' decisions regarding influenza vaccination may seem "irrational" according to traditional health understanding, but may make sense from a

cultural and acculturation standpoint (Todorova, 2014). Culture was recognized by the Surgeon General in 2001 in their discussions about effective service delivery to immigrant populations and ethnic minorities (as cited in Nicolas, DeSilva, Grey, & Gonzalez-Eastep, 2006). Conclusions drawn by this research may be useful in designing culture-specific interventions, administered during service delivery, that may help to increase vaccination rates in university students from Caribbean regions, and to develop culture-specific messages that may appeal to students when making decisions about influenza vaccination.

Problem Statement

Culture has been shown to be a factor in healing and healthcare delivery (Sodi & Bojuwoye, 2011). Concepts of health are shaped by cultural groups that influence how health is perceived and managed. Culture also influences if and when treatment is sought (Ravindran & Myers, 2012) and cultural beliefs have an impact on health decision making in terms of an individual's cultural literacy (Evans, Lewis, & Hudson, 2012). Cultural literacy refers to an individual's ability to recognize that culture, customs, and traditions determine how health information is received and interpreted and influences how illness is viewed (Evans et al., 2012).

Cultural beliefs such as apprehension about engaging in treatment, distrust of certain medication and therapies, religion, and the meaning of illness affect health behaviors (Campbell & Long, 2014). The topic of interest is culturally-influenced decision making as it relates to influenza vaccination among Caribbean-born university students. Young adults, in this university student age group, have experienced increased

doctor visits, increased health care expenses, and increased medications prescribed due to influenza; yet the influenza vaccination is underused by populations, such as this group, who would benefit from it (Cheney & John, 2013). On college campuses, there is a 9 to 48% prevalence rate of influenza-like illness among students and 63% of those presenting have laboratory-confirmed influenza (Guh et al., 2011). Students on a college campus in Florida are one of many populations that are especially vulnerable to influenza, due to the state's demographic characteristics (including large populations of immigrants) and geographic location, which makes it a place particularly vulnerable to individuals transmitting infectious diseases (Florida Department of Health [FDOH], 2016). These young adults are prone to contracting influenza due to the densely populated university setting and this can cause major health issues that can affect the students' academic success and overall wellness (Schlenker, Tschetter, & Straub, 2013). Research is lacking regarding beliefs concerning health in certain subpopulations (Adonis-Rizzo & Jett, 2006) and this subpopulation of Caribbean-born students was considered one of those groups.

Purpose of the Study

The purpose of this research was to determine the relationship between cultural health beliefs and beliefs about influenza vaccination among Caribbean-born university students. Acculturation was considered as students' beliefs about influenza vaccination that may be influenced by their level acculturation in the United States.

Research Questions

1. RQ1 – Are cultural health beliefs predictive of beliefs about influenza vaccination among Caribbean-born university students?

$H_0$1: Cultural health beliefs are not predictive of influenza vaccination among Caribbean-born university students.

H_a1: Cultural health beliefs are predictive of influenza vaccination among Caribbean-born university students.

Participants who scored high on the standardized measure of cultural health beliefs were hypothesized to have lower scores on a measure of beliefs about influenza vaccination.

2. RQ2 - Are cultural health beliefs predictive of beliefs about perceived barriers to influenza vaccination among Caribbean-born university students?

$H_0$2: Cultural health beliefs are not predictive of beliefs about perceived barriers to influenza vaccination among Caribbean-born university students.

H_a2: Cultural health belief are predictive of beliefs about perceived barriers to influenza vaccinations among Caribbean-born university students.

Participants who scored high on the standardized measure of cultural health beliefs were hypothesized to have high scores on a measure of beliefs about perceived barriers to influenza vaccination.

3. RQ3 – Is level of acculturation predictive of cultural health beliefs among Caribbean-born university students?

$H_0$3: Level of acculturation is not predictive of cultural health beliefs among Caribbean-born university students.

H_a3: Level of acculturation is predictive of cultural health beliefs among Caribbean-born university students.

4. RQ4 – Is level of acculturation predictive of beliefs about perceived barriers to influenza vaccination among Caribbean-born university students?

$H_0$4: Level of acculturation is not predictive of beliefs about perceived barriers to influenza vaccination among Caribbean-born university students.

H_a4: Level of acculturation is predictive of beliefs about perceived barriers to influenza vaccination among Caribbean-born university students.

It was hypothesized that there would be an inverse relationship between acculturation scores and scores on the standardized measure of cultural health beliefs and an inverse relationship between acculturation scores and scores on the standardized measure of beliefs about barriers to influenza vaccination among Caribbean-born students.

Theoretical Framework

The health belief model (HBM) was the theoretical basis for this research. This model was developed by Rosenstock (1966) and Rosenstock, Strecher, and Becker (1988) to explain certain health belief patterns and behaviors concerning preventive health. This theory was used because it is a systematic method for showing relationships between health behaviors and health service used (Shahrabani & Benzion, 2012). The key constructs of the HBM are perceived susceptibility, which refers to a subjective

perception of the risk of contracting a disease or illness; perceived severity, which refers to subjective perception of the gravity or seriousness of a disease or illness; perceived benefits, which refers to the subjective perception of the effectiveness of a health action if it is believed that there is susceptibility to a disease or illness; perceived barriers, which refers to the subjective perception regarding impediments to taking recommended action in regards to a disease or illness (Rosenstock et al., 1988). According to the HBM, cultural health beliefs as barriers to influenza vaccination acceptance will depend on the following predictors: perceived susceptibility to influenza, beliefs about the severity/seriousness of influenza, perceived benefits of the influenza vaccine in preventing the flu, and perceived barriers to getting vaccinated (Shahrabani & Benzion, 2012). The HBM was used in this study on vaccination because previous scholars have used the HBM as a conceptual model in studying vaccination issues and health behaviors (Chen et al., 2011; Cheney & John, 2013; Shahrabani & Benzion, 2010, 2012). To address individuals' beliefs, resistance or indifference to influenza vaccination, interventions and health messaging should be designed for different ethnic/racial populations. There are also disparities in resistance versus acceptance to influenza vaccinations between the ethnic groups. The HBM has been shown to be applicable in studies on vaccination compliance in regards to health disparities and prevention (Chen, et al., 2006), factors influencing influenza vaccinations (Chen, et al., 2011), underuse of influenza vaccine (Cheney & John, 2013), how experience shapes health beliefs about vaccinations (Shahrabani & Benzion, 2012), and vaccination decision making (Shahrabani & Benzion, 2010); yet, there have not been any studies done on a population

of Caribbean-born university students in regards to cultural health beliefs as possible barriers to influenza vaccination acceptance.

Nature of the Study

The methodology used for this research was a quantitative survey design. Results from this quantitative research determined the relationship between cultural health beliefs and beliefs about the influenza vaccination. Three self-report questionnaires were administered to explore the variables of cultural health beliefs and the susceptibility, seriousness, benefits, and barriers of influenza vaccination. A valid and reliable Health Belief Model Scale by Champion (1984, 1993) and adapted for a study on influenza vaccination (Kwong, Lam, & Chan, 2009) was used to measure perceived susceptibility, seriousness, benefits, and barriers related to influenza and influenza vaccination. There were 25 questions. A validated Health Beliefs Questionnaire by Furnham (1994) was used to measure cultural health beliefs of the participants. The questionnaire consisted of 80 questions in each of five cultural belief categories – Faith, Cultural Traditions, John Henryism, Rejecting Medication, and Reliance on Family. The Health Belief Questionnaire consisted of questions that assessed individual beliefs about illness and health issues. Faith was referred to as the belief that God, and not traditional treatment, has control over health. Cultural traditions were referred to as the belief that cultural wisdom and traditions influence health behavior and treatment adherence. John Henryism referred to the belief that an individual has physical and mental control over his or her own health and can rely on inner strength to resolve environmental stressors. Rejecting medication reflected the belief of adhering to folk or alternative medicine for health

management and treatment, as opposed to traditional medicine. Reliance on Family reflected the dependence on friends or family for advice and support regarding health issues as opposed to accessing traditional mental health or medical treatment (Cole, Stevenson, & Rodgers, 2009). The sample was Caribbean-born students who attended Florida International University in Miami, Florida. Cultural beliefs are a system of shared beliefs that socially define a group of people, gives a sense of commonality, and are transmitted from generation to generation through learning (Hall, 2002; Trenholm & Jenson, 2000); therefore, cultural health beliefs are a system of shared health beliefs that define a group of people. Caribbean-born students were students that were born in any one of the 32 Caribbean islands and living in the United States. Differences in cultural health beliefs among Caribbean-born students were evaluated. Level of acculturation among Caribbean-born students living in the United States was measured by using the Abbreviated Multidimensional Acculturation Scale (Zea, Asner-Self, Birman & Buki, 2003) to determine if cultural health beliefs about influenza vaccination vary depending upon level of acculturation. There were 42 questions that asked about cultural affiliation, preferred language, and understanding about U.S. versus native popular topics. The higher the score, the higher the acculturation to U.S. culture. It was predicted that the higher the level of acculturation in the United States, the less likely students were to reject the influenza vaccination. Acculturation level was assessed to determine the association with cultural beliefs and beliefs about influenza vaccination. The assumptions of this study were that the data collected will represent the target population of Caribbean-born students at Florida International University that met the selection

requirements. It was expected that the independent variable of cultural health beliefs would have an effect on the dependent variable of beliefs about susceptibility, severity, benefits, and barriers regarding influenza vaccination. The study was limited to questions regarding cultural beliefs (faith, cultural traditions, John Henryism, rejecting medication, and reliance on family). Upon analysis of study findings, a discussion was given of generalizability of findings to other college-age populations that may be influenced by cultural health beliefs or populations that may have variable beliefs regarding influenza vaccination, associated with level of acculturation. I administered the questionnaires, gathered all data, and performed all analyses in this study.

Significance

This research filled a gap in understanding cultural health beliefs maintained by Caribbean-born university students, after migration to the United States, that may act as barriers to the acceptance of influenza vaccination. It is critical to understand the impact of cultural health beliefs among this group of students and how these beliefs can be addressed when these students present for health care. Results from this research can be used to develop education material and programs on influenza that is culturally relevant for these students and encourage their willingness to be educated about influenza vaccination and its benefits, which could lead to increased vaccination acceptance. The results also helped to determine if culturally relevant material is needed if students are likely to adhere to the health belief and value systems of their residential country. Wheeler and Mahoney (2008) found that a challenge to Caribbean immigrants regarding the use of health care services in the United States is the retention of their belief practices

that leads to being reactive instead of proactive in addressing health problems, which undermines the need for preventive care. Wheeler and Mahoney (2008) suggested developing programs that meet the needs of immigrant populations, considering their level of acculturation. This research provided insight into how cultural beliefs impact health care decisions in regard to influenza vaccine use among subgroups of university students. This research provided information that will be useful in attempts to increase immunization rates by being aware of the association between cultural health beliefs and influenza vaccination.

In chapter 2, I will discuss the cultural health beliefs that were studied to determine culture influence on perceptions about influenza vaccination and will discuss acculturation.

Chapter 2: Literature Review

Introduction

The topic of interest was the impact of culturally-influenced decision making regarding influenza vaccination among Caribbean-born university students. Culture has been shown to be a factor in healing and healthcare delivery (Sodi & Bojuwoye 2011), and influences if and when treatment is sought (Ravindran & Myers, 2012). Cultural beliefs have an impact on healthcare decision making (Evans et al., 2012). Sodi and Bojuwoye (2011) discussed Western-oriented health care models and suggested that these models cannot be efficient when applied to treating individuals of non-Westernized cultures if the culture of those individuals is not considered. This may be an aspect to consider when encouraging students of a non-Westernized culture to accept the influenza vaccination. Ravindran and Myers (2012) found that culture encompasses attitudes and beliefs and culture shapes individual perception and management when addressing health. This concept related to this study in the investigation of whether Caribbean-born university students' perception of susceptibility to and severity of influenza, based on their cultural beliefs, create barriers to their acceptance of the influenza vaccination.

This chapter includes a discussion of influenza vaccinations and the cultural beliefs in the areas of faith, cultural traditions, John Henryism, rejecting medication and reliance on family that impact perceptions about influenza vaccination and decisions regarding accepting or rejecting the vaccination. The databases searched were PsychINFO, PsychARTICLES, SocINDEX, and MEDLINE. The following search terms led to the articles used for this research: *influenza, influenza vaccination, cultural beliefs,*

health perceptions, university students and health, college students, healthcare decisions and influenza, HBM.

Influenza Vaccination

Vaccination is the primary prevention method to curb the spread of influenza infection and the complications that are capable of causing widespread disease transmission (CDC, 2016), and is noted as the most effective strategy against influenza infection and transmission annually (CDC, 2015; DiClemente et al., 2012). A leading public health concern continues to be the resurgence of contagious diseases, and therefore, the emphasis on vaccination due to the CDC's recommendation that the administration of vaccinations is the most effective method to curb infectious disease transmission (Song, 2014). Throughout the influenza season, the CDC continues to recommend that healthcare professionals encourage unvaccinated individuals, beginning at 6 months old, to get vaccinated. The proponents in the healthcare industry believe that vaccinating 95% of the population will protect the unvaccinated few, ensuring herd immunity. Herd immunity occurs when the majority of the population in a community is vaccinated in order to protect the unvaccinated (such as newborns), thereby restricting the spread of the disease (Song, 2014). The concept of herd immunity proves fruitless if populations do not subscribe to the utility of vaccinations. In 2013, FDOH reported that only 18.6% of adults 18-44 received a flu shot. Song (2014) surveyed 1,213 adults and found that, theoretically, an individual will determine the risks versus benefits of vaccinations, and will only have a perceived utility for vaccinations if the benefits seem to outweigh the risks. The benefits and risks are considered at an individual and

collective level. On an individual level, the benefits may be evident by being free of contracting diseases, while on a collective level, the benefit may be seen as avoidance of an epidemic of a preventable disease. The risks, on an individual level, lie in the possibility of an adverse reaction to a vaccination versus, on a collective level, there may be side effects suffered later on from early childhood immunizations. How individuals determine the importance and utility of vaccinations depends on their perceptions of benefits and risks (Song, 2014). Cameron et al. (2009) conducted a focus group of 48 African American adults and found that that an individual may ignore a threat (likelihood of influenza infection) if they perceive themselves not to be susceptible to the severity of the threat. The individuals may perceive the susceptibility and severity of the threat to be high but may not perceive the response (influenza vaccination) as efficacious. Cameron et al. (2009) found that the HCWs were not confident in the efficacy of the vaccine. Some may believe that the side effects outweigh the benefits (Johansen, Stenvig, Wey, 2012), and perceive that there was no need to be vaccinated (dePerio, Wiegand, & Evans, 2012; Mehta, Pastor, & Shah, 2008; Rhudy, Tucker, Ofstead, & Poland, 2010). Participants in these studies believed influenza vaccination should be a personal health decision and they did not give high priority to their status in preventing influenza transmission. Rhudy et al., (2010) found that nurses believed that thorough hand washing was an effective prevention method against the transmission of influenza, although there was evidence that handwashing alone is not sufficient (Department of Health and Human Services [DHHS], 2009).

Possible reasons for rejection of the influenza vaccination by university students is their belief that the risks may outweigh the benefits, they may not perceive themselves as susceptible to influenza infection, or they may not perceive the vaccination to be efficacious. In this study, I determined if these reasons, as they apply to adults, also applied to Caribbean-born university students. Additionally, contributing to the rejection of vaccination may be the increased attention paid to stories regarding adverse effects experienced by children following immunization. Vaccinations have been wrongly accused of causing autism, sudden infant death syndrome (SIDS), allergies, asthma, cancer, diabetes, multiple sclerosis, and AIDS; although, in these cases, the etiology of the disease varied, was poorly understood, or not known (MacIntyre & Leask, 2003). For example, the association between autism and MMR vaccination began due to the onset of developmental problems (at 18-19 months) and receiving the MMR vaccination before a child's second birthday. This did not determine causation; yet, antivaccination advocates and some doctors prematurely blamed the MMR vaccine. Yet, in an epidemiological study of 1.8 million children over 14 years, Patja et al. (2000) found that not one single child developed autism after receiving the MMR vaccination. In the case of allergies and asthma, vaccines were also implicated as the cause in several developing countries, but causation could not be determined because contributing factors were genetic, lifestyle, and environmental (Anderson et al., 2001; Hurwitz & Morgenstern, 2000; Wickens et al, 2001). Although some information has led to anti-vaccination beliefs, Song (2014) also suggested that individuals' knowledge about vaccinations can influence positive judgments about receiving vaccinations, as opposed to being influenced by unfounded

information. These individuals can gain sound knowledge based on scientific findings or information received from what they consider to be trusted experts, therefore they are more likely to believe vaccinations are more beneficial than dangerous. An aspect to consider is whether university students, who may be likely to reject the influenza vaccination, are receiving information about the vaccination from what they consider to be experts on the issue.

As a public health intervention, vaccinations have been shown to be successful and have eradicated many infectious diseases, but their use is not without the aforementioned issues. Although vaccinations are beneficial, individuals will determine if the benefits outweigh the risks and make decisions based on their perceptions of the importance and utility of vaccinations. Therefore, the personal meaning of influenza vaccination to individuals may be dependent on scientifically-based evidence or controversial information, and personal meanings can be different for each individual (Todorova, 2014). Therefore, it is a relevant public health matter to discern the personal meanings and perceptions that determine the decisions of individuals, such as university students, regarding the rejection of influenza vaccination.

Influenza Vaccination at Institutions of Higher Education

In this study, I examined beliefs about influenza vaccination among university students. College students (in the 20-34 age range) are considered one of the at higher risk groups for influenza infection (Schlenker et al., 2013; Van et al., 2010; Yang, 2012). These students are prone to contracting influenza, due to the densely populated university settings, which could cause health issues that affect students' academic success and

overall wellness (Schlenker et al., 2013). Influenza outbreaks on university campuses range from 9-48% of university students infected (Poehling et al., 2012). These outbreaks contributed to the recognition that this population should be addressed in the universal influenza vaccine recommendations issued in 2010 by the Advisory Council on Immunization Practices in the United States (Poehling et al., 2012). The recommendations of the Advisory Council were for all students, especially those occupying dormitories, to be vaccinated during an influenza epidemic in order to reduce the risk of morbidity and interruption of normal campus activities (Fiore et al., 2009; Poehling et al., 2012).

From year to year, young adults, in this college student age group, have experienced increased doctor visits, increased health care expenses, and increased medications prescribed due to influenza; yet, the influenza vaccination is underused by populations, such as this group, who would benefit from it (Cheney & John, 2013). The extensive populations of young adults at higher education institutions contribute to the potential of these institutions becoming outbreak epicenters, which can have an impact in the event of an influenza epidemic (Akan et al., 2010). Nichol et al. (2010) found that increasing vaccination rates on a college campus by 20-30% beyond current rates could prevent a possible influenza outbreak. In the United States, there were greater than 17 million students attending 4,300 colleges and universities with more than 3 million working faculty and staff members (CDC, 2010), indicating large populations in closed environments that could be at-risk for influenza (Nichol, et al., 2010). In October 2009, a pandemic influenza surveillance network coordinated by American College Health

Association (ACHA) found that, of the 274 universities and colleges that participated in the network, 97% reported new cases of individuals with influenza-like symptoms. By February 2010, the ACHA reported that more than 90,000 individuals in the network presented with H1N1 symptoms. It was, therefore, important to develop and implement strategies that reduced the number of students who became sick or could possibly succumb to influenza, with the intention of reducing academic disruption (CDC, 2010).

Communicating the seriousness of influenza infection and the need to use preventive measures is the challenge for student health professionals. Akan et al. (2010) indicated that 25.1% of students perceived their risk of contracting influenza as high, the majority of students (40.5%) perceived their personal risk of contracting influenza as moderate, and 7.7% perceived their risk as low. Within the study group, 92.8% of students reported their refusal to be vaccinated due to concerns regarding side effects and safety of the vaccination, which suggested high perceived risk (Akan et al., 2010). Seale et al. (2012) found that students did not feel they were at risk of becoming influenza-infected and felt they could "fight off" any illness because they were "fit and young", suggesting low perceived susceptibility. University students perceive being administered the influenza vaccination as high risk and do not perceive themselves as susceptible to influenza. Byrne, Walsh, Kola, and Sarma (2012) studied intention to receive the H1N1 influenza vaccination and found that 64% of 200 university students reported an intention to take the vaccine if asked by authorities to do so, 18% did not intend to take the vaccine and this group reported lower perceptions of vaccination benefits, and higher perceived barriers. Byrne et al. (2012) showed that those students who intended on taking the

vaccine believed that vaccination protected against infection and reported higher rates of provaccine attitudes; meanwhile, the students who did not intend on taking the vaccine were opposed to vaccinations in general. Cole et al. (2015) found significant effects of cognitive appraisals on decisions regarding the H1N1 vaccination among an 18-24-year-old college population. Of the 270 participants, 60% did not intend on getting vaccinated and reported that they felt the vaccine was not safe, not effective, and unattainable (Cole et al., 2015), indicating high perceived risk. These research studies addressed the factors of perceived susceptibility, perceived risk versus benefits, and perceived barriers related to influenza vaccination, which were the factors investigated in this study. University students perceived influenza vaccination to be high risk and low benefit, perceived low susceptibility to influenza, and high perceived barriers to taking the vaccination, which may all contribute to the rejection of the influenza vaccination by university students. What was not known was whether these results would apply to Caribbean-born university students as it relates to cultural health beliefs.

Caribbean Culture and Health Beliefs

Caribbean culture is multifaceted because each island or territory is characterized by indigenous belief systems, customs, and practices, although there are cultural similarities economically, linguistically, ethnically, and politically. The ethnic groups brought to the Caribbean by European colonists each brought their own traditional customs (i.e., the Africans brought religious practices such as voodoo and the East Indians brought curry and other spices) that have been incorporated to create a Caribbean culture. This culture is diverse, but with a unique identity associated only with the

Caribbean (Author, 2012). People from this geographic region claim to be Caribbean regardless of which island they are from. Due to the inclusion of mainland Caribbean countries like Belize and Guyana, Spanish-speakers are the largest group of Caribbean people. English-speakers comprise approximately one quarter, French-speakers comprise 22%, and Dutch-speakers comprise only 1% of the Caribbean population (Premdas, 2011). Although Caribbean culture may be diverse, culture will be considered on a macrolevel as the language, beliefs, practices, values, history, and experiences that create commonalities between individuals of a particular region are shared between populations and generations (Samuels, Guell, Legetic, & Unwin, 2012).

Many of the Caribbean cultures descended from the traditions of Africa and, although has often integrated with the ethno-traditions of American Indians, Europeans and Christianity, the strong African beliefs in the healing power of the spirits and the help of a shamen to manage a person's health still exist today. These cultures have their own systems of health beliefs that describe illness. The predominant views continue to attribute illness to nature, the occult, spirits, power of religion, and use of herbs. It is believed that a natural illness can result from physical or environmental factors, such as infection or the weather (Stanford School of Medicine, 2017). An occult illness is attributed to evil spirits or other supernatural factors, such as the curse of jealousy (Archibald, 2011). A commitment of sin or other violation, such as theft, murder, or adultery is believed to cause a spiritual illness. There is also the belief that the use of herbs or roots can cure illness, which includes the belief that a hex can be cured by a "root doctor" (Stanford School of Medicine, 2017). There continues to be a belief in the

efficacy of traditional folk and herbal medicines, and even traditional foods, as integral to overall health and wellness (Archibald, 2011). Moss and McDonald (2005) found that the six participating individuals opposed traditional medicine due to their belief in the treatment efficacy of native foods and herbal medicine and their treatment regimen was guided by dreams, visions, revelations, and prayers, which they believed relieved symptoms. The individuals were all female and brought a variety of herbs (i.e., Seed under Leaf, Keneel, John Cutlass, Golden Bush, Clap Head, Carila, Bald Head, Part of Man's Life) that they believed treated their diabetes and it was determined that these individuals adhered mainly to their herbal medicine than a prescribed diabetes regimen. It was not noted whether or not the herbal treatment was successful, but that the herbal treatment offered the individuals some symptom relief and treatment satisfaction. In another qualitative study on Type 2 diabetes and health beliefs among 16 African-Caribbean individuals, Brown, Avis and Hubbard (2007) found that the individuals preferred to use their own natural medicines to treat their diabetes, but outcomes were poor because of the lack of knowledge and understanding of diabetes management. These studies are discussed because they include a Caribbean sample of individuals and are examples in which cultural health beliefs supersedes belief in the utility of conventional medicine. Adonis-Rizzo and Jett (2006) conducted the qualitative study on 10 Haitian individuals who had lived in the United States over 10 years and referred to influenza as the "big cold." As in the previous studies on diabetes, the Caribbean-born individuals in this study preferred to use traditional herbal medicines because they believed that influenza was just a big cold and should be treated as such. Adonis-Rizzo and Jett (2006)

also found that traditional herbal teas used by Haitian people, and other Caribbean people, have gained popularity in Westernized U.S. culture and is sometimes prescribed as part of an alternative or complementary treatment regimen. The individuals in the target sample claimed to be willing to accept using prescribed medicine if it was recommended by a person of authority who they trusted and respected. A lack of communication between health professionals and individuals of different cultures, regarding cultural health beliefs about disease and illness, may contribute to these individuals not receiving appropriate care (Nicolas et al., 2006). Pertaining to influenza vaccination, this lack of communication may be one, of possibly several, factors contributing to the lack of acceptance of the vaccination by university students who subscribe to the health beliefs of their Caribbean culture. Culture influences health beliefs and behavior and has an impact on whether individuals seek medical care or service (Ravindran & Myers, 2012) because individuals perceive illness in the context of their group's cultural values and beliefs (Campbell & Long, 2014). Therefore, university students with cultural health beliefs may perceive influenza as an illness that can be treated by traditional, as opposed to conventional, treatment methods and may be inclined to reject influenza vaccination as a preventive method.

The issue with Caribbean-born students adhering to traditional cultural health practices is that their approach is reactive, instead of proactive, which undermines prevention efforts in this population (Archibald, 2011). Cultural beliefs in relation to health is recognized among other cultures of people (Cole et al., 2009; Zhao, Esposito, &

Wand, 2010), but that aspect is beyond the scope of this research, as the target of this study is university students of Caribbean culture.

Faith

Faith is defined as the strong religious beliefs or feelings, as in the existence of God (Merriam-Webster, 2015), and is also referred to as an individual's belief in a universal power, as defined by that individual (Meisenhelder, Schaeffer, Younger, & Lauria, 2013). Showing faith by way of praying or other religious expression most commonly involves trusting in the power of God or other higher power, alleviation of fear of sickness, ill health or dying, appraising ill health in a positive light, and considering daily blessings (Bryan et al., 2016).

Sutton and Parks (2013) conducted a meta-analysis of multiple studies and found that faith provides a basis for surviving, coping, and flourishing in the lives of many racial/ethnic groups. Sutton and Parks (2013) discussed the vital role of faith doctrines in faith-based HIV prevention services and in efforts to combat the HIV epidemic in disproportionately affected populations. Masters (2012) found that, by believing in God, individuals who are disadvantaged in a community find meaning in the connection of divine control and coping during trying life situations and illness. Nicholas et al. (2006) found that spiritual care is a mode of symptom management. Inclusive in faith-based healing, coping mechanisms, such as prayer, have been reported among distressed individuals suffering from cardiac diseases as being a source of empowerment that fosters a positive locus of control (Ai, Wink, & Shearer, 2012). Ai et al. (2012) found that patients who suffered from cardiac disease suffered less mental fatigue at their 30-month

follow-up as a result of their reported preoperative prayer coping. From a cultural perspective, the healing power of prayer is intertwined with an individual's faith and sustained by religious beliefs, practices and traditions defined by particular cultural groups (Krucoff & Crater, 2009; Regan, 2014). There is growing evidence on the impact of faith/religious coping on cancer (Pedersen et al., 2013), anxiety (Pieper & van Uden, 2012), and mental distress (Bhui, King, Dein & O'Conner, 2008). Having faith in God or other chosen higher power has been shown to be a method of coping with disease and Pedersen, Christensen, Jensen and Zachariae (2013) have shown that faith has been reported by individuals as being associated with adherence to treatment for breast cancer and impact on quality of life. Pedersen et al. (2013) analyzed data on a cohort of 4,917 women treated for early breast cancer and determined that individuals turn to their faith to cope with illness. There were 53.7% of the women who reported their faith has an influence on their quality of life, 40.8% reported getting that they felt comforted and strong due to their faith, and 34.5% believed that their faith improved the endurance of their breast cancer. Kar (2008) reported that faith-based healing is practiced all over the world and is accessed for various forms of illness, but more often for mental issues due to the unknown ethology and progression of the illness. Kar (2008) conducted a qualitative/quantitative study on the belief in faith healing and found that 75% accessed faith healing before accessing conventional medical care and 68.4% were diagnosed with psychopathology, but continued to believe that faith healing was efficacious. Pieper and van Uden (2012) studied the extent to which patients used their faith/religious coping to deal with their problems and the effectiveness of faith/religious coping on their wellness

and found that the positive effects of religious coping lead to increased overall wellness and decreased anxiety. Bhui et al. (2008) compared patterns of faith/religious coping in dealing with mental distress across ethnic groups, one of which was African Caribbean Christians. Bhui et al. (2008) found that religious coping included prayer, having trust and a relationship with God, talking to God, using amulets, and listening to religious radio. Frequent use of these religious coping strategies was shown to lead to changes in emotional states and had implications for promoting resilience and recovery, especially in cases where conventional psychiatric practices were culturally unacceptable. Chatters et al. (2008) examined the extent to which participants used religious coping (i.e., praying) and how it varied across subcultures among non-Hispanic Whites, Caribbean Blacks, and African Americans. Chatters et al. (2008) were interested in within group variability in regard to ethnicity among the African American people, due to the fact that the racial category of Black is rarely explored from an ethnically heterogeneous perspective. The main questions asked regarding perceptions about religious coping were, "How important is prayer when you deal with stressful situations" and "I look to God for strength, support, and guidance." There were similarities as well as differences between groups, with African Americans and Caribbean Blacks reporting an overwhelming endorsement of religious coping, while non-Hispanic Whites showed lower levels of endorsement, and Haitians were more likely than Jamaicans to use religious coping when addressing adverse health issues. Umezawa et al. (2012) found that the belief in divine control over health was more prominent among African Americans than non-Hispanic Whites, although there was no distinguishing of African American ethnic groups. Findings from

these studies contribute to the advocacy for exploring relationships between ethnically and culturally diverse groups, as it relates to health and the application of faith and religious coping, and the differentiation among African American groups. Bache et al. (2012) studied Caribbean cancer survivors and found that faith in individuals' religion played an important part in their spiritual coping with long-term cancer. This spiritual coping meant having a sense of meaning about the disease, getting emotional comfort, which lead to emotional strength and contentment in dealing with their disease, promoting a positive outlook and acceptance of their destiny.

Information from these research studies shows that faith as a health belief is prevalent in coping with a diverse array of illnesses and diseases. The conclusion is that faith, provides a basis for surviving and coping with illness, disease, and adverse life situations, is associated with adherence to medical treatment and improved quality of life, is a source of empowerment that promotes resilience and recovery, and is observed in ethnically diverse groups across cultures. Faith has been assessed in association with various illness/diseases such as cancer, HIV, mental health distress, and anxiety. This study filled a gap where research was lacking regarding faith as a cultural health belief associated with influenza vaccination decisions.

Cultural Traditions

Cultural traditions affect individuals' beliefs about health care and their beliefs about how they are to manage and cope with illness. Individuals approach illness and disease diagnosis with culture-specific meanings, values, and ideas when reporting their symptoms, their expectations about health care delivery, and beliefs regarding treatment

options (McLaughlin & Braun, 1998; Ravindran & Myers, 2012), which all affect their decision making (Evans et al., 2012). The beliefs and norms that constitute culture frames a group's worldview and influences the cultural traditions that are practiced by a group in regard to health (Ravindran & Myers, 2012).

The belief in herbal medicine, folk remedies, traditional foods, toxic cleansing or 'washout', and keeping 'good blood' are some of the cultural practices in Caribbean countries (Archibald, 2011; Brown et al., 2007; Nicolas et al., 2006; Scott, 2001). The cultural tradition practice washout is a toxic cleansing of impurities from the body, by means of a concoction of liquids (i.e., cider, water, vinegar, Epsom salt), teas, or specific foods (i.e., garlic onion, cod liver oil, castor oil, coconut oil). The washout is believed to generally cleanse the bladder, blood, skin, pancreas, and liver; aid in weight loss, relief of lethargy, and relief of bloating, and relieves constipation during menstruation. An explanation for performing a washout included improving the quality of an individual's blood, described as good or bad blood. An individual was considered to have bad blood, an index of poor health, if they had such diseases as diabetes, cancer, sickle cell, jaundice, hepatitis, tuberculosis, or a skin condition (Scott, 2001). Archibald (2011) studied cultural identity among Afro-Caribbeans residing in South Florida and found that beliefs in cultural traditions consisting of herbal medicines and folk remedies were prominent among Caribbean people who resided in the United States. The participants reported accessing mainstream American healthcare only after attempts at using their traditional remedies. Nicolas et al. (2006) conducted a study to understand illness among Haitians living in America and found that the use of herbs was a staple in treating

symptoms of sickness. Haitian participants admitted to using senna, an herb used as a laxative to ease indigestion, the sarsaparilla root to purify the blood and clean such internal organs as the kidneys, spleen, and liver, or visiting a medsen fey, a medicine man that uses herbs and plants to treat illness or promote wellness. Jamaican participants reported using a bush called cerassee to treat colds and lemongrass ('fever grass') to alleviate high body temperatures. Brown et al. (2007) interviewed 16 Afro-Caribbean individuals and found that herbal and folk medicine, along with a mainly Caribbean diet, were commonly used to treat Type 2 diabetes, due to the people's cultural belief in the efficacy of traditional herbs and food. The common theme among studies was that Caribbean people, living outside their country of origin, still maintained their cultural health beliefs when treating illnesses and diseases due to their distrust of conventional treatment advice from health professionals and preference for natural treatments. What is not known is if herbal remedies are believed to be useful in the prevention or treatment of influenza, as opposed to an influenza vaccination.

John Henryism

Sherman James (1994), a public health investigator coined the term John Henryism in 1993, during his research on disparities among African Americans. The term was named for a Black folk hero, named John Henry, the steel-driving man in the 1870s whose exceptional strength became legendary throughout the east to west coast frontiers. According to the story, the railroad owner bought a steam-powered hammer that would outperform the steel driving workers and threatened to put the steel drivers out of work. In defense of the jobs of the steel drivers, John Henry convinced the railroad owner to let

him challenge the steam-powered hammer, which he did and defeated the machine. John Henry was able to hammer faster than the steam-powered hammer, but due to extreme exhaustion, he died in victory a few moments after with his hammer in his hand (Bennett et al., 2004; Flaskerud, 2012; James, 1994). Hence, John Henryism (JH) became a symbol of endurance and strength that involved placing cultural values on individuals' commitment to mastering the circumstances of their environment with determination, efficacy vigor, and hard work (Flaskerud, 2012; James, 1994; Merritt & Dillon, 2012). JH has since been recognized, by psychologists, as a coping behavior observed mostly among African Americans when dealing with environmental stressors, hence researchers have investigated JH as a coping behavior and its impact on health outcomes (Bennett et al., 2004; Flaskerud, 2012; Merritt & Dillon, 2012).

Sherman James (1983) has studied this construct as early as 1983 by examining socioeconomic status (SES) and JH on blood pressure in 132 working-class Black men and found that Black men with minimal education and high scores on a JH scale had higher diastolic blood pressure than the men who scored lower on the scale. Bennett, Williams, Sollers, & Thayer (2004) also found low SES and high JH to be associated with higher cardiovascular responses to personal stressors in a study of 58 healthy Black men. Bennett et al. (2004) reviewed multiple studies in which the JH construct was studied using the quantitative John Henry Active Coping Scale (JHAC) among African American and White target populations. The findings showed support for the construct among rural, poor African American populations (among which the concept originated), but showed lack of external validity in other African American populations. It was

suggested that further studies are conducted to determine variances due to environmental and genetic influences. Matthews, Hammond, Nuru-Jeter, Cole-Lewis, & Melvin (2013) investigated JH in relation to racial discrimination and depressive symptoms and found that there was an inverse relationship between JH and depressive symptoms. Contrary to the studies of poor health and high JH, Bonham, Sellers, & Neighbors (2004) found a positive relationship between physical health and high JH which lead to questions as to whether JH could have a positive impact on health. Bonham et al. (2004) found that among a sample of high SES African American males, high JH was correlated with better physical health. The findings lead to questions as to whether SES may be the factor that influenced health more than JH. It is apparent that the JH construct and health outcomes need further study, as studies should include other ethnic groups who might subscribe to different cultural values.

Rejecting Medication

The estimation is that approximately 30-50% of medication prescribed to individuals are not actually taken, which has an impact on healthcare use. Shaw et al., (2009) found that the concept of health culture consists of a complex system that encompasses knowledge of illness management, which in turn influences decisions regarding adhering to medically-prescribed therapies. Hence, health-care use is affected by differences in cultural health beliefs and behavior, thereby affecting adherence to medications (Horne et al., 2004). Horne et al. (2004) conducted a quantitative study on 600 undergraduate students to examine the influence of cultural background on beliefs about medicine taking. The participants were asked to select their cultural background

from a list that included Afro Caribbean, European, Asian, African, or other. Horne et al. (2004) found that students' views about the potential benefit and harm of medication was influenced by their cultural background, and the association between beliefs about medication and cultural background was significant even when researchers controlled for gender and experience with taking medication, supporting the implication that health professionals should consider the importance of culture on health and treatment beliefs. Folk medicine that is influenced by culture and highly acceptable in certain societies is likely a factor in the rejection of conventional medication, as discussed in the previously mentioned Moss and McDowell (2005) study on Caribbean people and diabetes. In reference to influenza, if folk remedies are subscribed to by individuals from certain cultural backgrounds, then it would be understandable that these individuals subscribing to those remedies would find influenza vaccination in conflict with their remedy.

An issue, that may be impacting rejection of medication, is mistrust of the mainstream healthcare system by many African Americans due to the 40-year old Tuskegee Experiment conducted from the 1930s to 1970s by the U.S. Public Health Service. In this infamous study, Black men were recruited to participate, injected with syphilis, and left untreated (even with the invention of penicillin) for the purpose of enabling researchers to study the progressive effects of the disease. These men were treated horribly and exploited along with the extensive disability and death caused by this disease (Emanuel, Abdoler, & Stunkel, 2009). Today, there are ethical guidelines for research of human subjects that prevent such atrocities, but the psychological scars are historical. Emanuel, et al. (2009) discussed the ethical treatment of individuals who

participate in research and suggested abiding by ethical principles when conducting studies and human subjects. Consequently, study findings have shown that ethnic minorities have a mistrust of medical treatment (Brown et al., 2007; Campbell & Long, 2014), clinical care and medical settings (Breland-Noble, Bell, & Burriss, 2011) and this mistrust is found to be a factor in lack of research participation (Brown & Moyer, 2010; Mays, Coles, & Cochran, 2012). In their interviews of 17 African-Caribbean participants, Brown, et al. (2007) found that the participants felt that Black people are not given the same quality service as White people because health professionals do not understand black Caribbean people's needs and thus ignore those needs. The distrust in the medical system was also echoed in Campbell and Long's (2014) study of 17 African American participants who expressed that white health professionals were not seen as being able to understand African Americans apprehensions about medical care. Breland-Noble et al., (2011) interviewed 24 African Americans of Caribbean descent and found that the negative impact of the Tuskegee Study has led to trust issues with treatment and research. The participants felt that these trust issues have created a barrier between African Americans of Caribbean descent and clinical care providers, which could be alleviated by developing rapport in a culturally-friendly manner. Mays et al., (2012) reviewed a preponderance of studies that supported the detrimental impact of the Tuskegee Study on the willingness of African Americans to participate in treatments and research before their investigation of the legacy of the Tuskegee Study. It was not specified whether any of the participants were of Caribbean descent. Their findings showed that African Americans were apprehensive about participating in treatment, interventions, and

prevention research, but the reasons were more complicated than blaming the Tuskegee Study. May et al. (2012) found that other reasons included culturally incompetent investigators, no African American bioethics guidelines for non-African American investigators, and studies that do not incorporate ethnic/racial type designs. The issue is not who is to blame, but that there is apprehension about participating in research and treatment.

Despite the development of modern medicine, it is apparent that there is still regard for culturally-influenced treatment regimens that may reject the use of modern medicine. Ingrained health beliefs reflect the cultural and historical traditions of Caribbean populations, which may include distinct practices not recognized or respected by westernized healthcare professionals. The issue was whether there is an association between the cultural health belief about rejecting medication and beliefs about influenza vaccination among Caribbean-born university students.

Reliance on Family

Although it has been suggested that further exploration is needed regarding medical decision making and family involvement, it has been found in many cultures that the individual's concept of autonomy involves the family at some level (Lin, Pang, & Chen, 2012). Ravindran & Myers (2012) stated that at the microsystem level, family members can significantly influence children's lives through strong cultural beliefs held by the family members. Studies involving the examination of family relationships and university populations have mainly focused on parents, but siblings, extended family members, friends, and other family groups have been recognized as also significant

(Horwitz, Reynolds, & Charles, 2015; Milberg, Wahlberg, & Krevers, 2014; Woods, Priest, & Roush, 2014), with the understanding that family may be defined differently by different cultures. Due to extended kinship bonds, grandparents, uncles, cousins, aunts, and nonbiologically-related family members may have important roles in the family unit and may be consulted in health-related decisions. Horowitz et al. (2015) found in their quantitative study that the support of friends was just as important as the support of family in lowering psychological stress. Evidence has emerged that highlights the importance of family support in the palliative care context (Milberg et al., 2014), which could extend to an examination of family support in relation to influenza risk and influenza vaccination decisions. Woods et al. (2014) studied a sample of 1321 Whites, Hispanics, African Americans, and Afro-Caribbeans, but unlike Horowitz et al. (2015), found family and spousal support to be more impactful in buffering depression and anxiety than the support of friends.

Carr and Springer (2010) commented that there has been an increase in studies linking the close relationships of family to health outcomes and the findings discern the impact of social determinants on an individual's health. The social support from friends, immediate family, loved ones, and closely related groups is quite often an asset to individuals dealing with stress, anxiety (Schwarzer & Knoll, 2007), and depression (Cohen, 2004; Cyranowski et al., 2013) and has extended to other health outcomes, such as immune functioning and inflammation (Woods et al., 2014). Lin et al. (2012) explored individuals' surgery decision making, and the meaning of family involvement and found that medical professionals were able to effectively communicate with the individual and

the family based upon the understanding of the family's part in the individual's decision making process regarding surgery. Milberg et al. (2014) studied the influencing factors on patients' sense of family support among adult patients and concluded that patients' sense of family support was of high relevance to the patients' health, and patients who had a lower sense of family support more often experienced stress, anxiety, and nervousness. The structure and function of family units and the family support system have been shown to influence individual psychological well-being over time (Antonucci, Akiyama, Takahashi, 2004; Fuller-Iglesias, Webster, & Antonucci, 2015; Thoits, 2011). In addition, Merz, Schuengel, & Schulze (2009) found through their study of intergenerational relations between parents and children that the quality of family emotional support had more of an effect on well-being than support exchange (the giving and receiving of emotional support across generations).

Ethnographic research on Black Caribbean-born individuals demonstrates that family, religious entities, and community is a source of emotional, social and ethnic identity support (Chamberlain, 1999; Thompson & Bauer, 2000). Thompson and Bauer (2000) found that family support is part of a social system that is a staple in Black Caribbean families. In a study of family support networks and social anxiety disorder (SAD), Levine, Taylor, Nguyen, Chatters, & Himle, (2015) found that family support is a protective factor against SAD and negative family support is a risk factor for the disorder. Levine et al. investigated a sample of Black Caribbean people because of the increase in immigration populations from Caribbean countries and the lack of ethnic heterogeneity when describing Black populations. Negative support was described as closeness to

family and dichotomized as low negative interaction or high negative interaction. From a caregiving perspective, Friedemann, Buckwalter, Newman and Mauro (2013) found that between Caribbean Blacks, Hispanics, and Whites, there was a larger percentage of Caribbean Black family members that took care of sick family members and the family unit that lived together tended to be larger than the other cultural groups. Koffman, Morgan, Edmonds, Speck and Higginson (2012) studied the meaning of social support among minority ethnic groups and found that Black Caribbean people also considered their church community as family and that community played a key emotional support role in the lives of these Black Caribbean people living with cancer. The emotional support included having a community member provide comfort, conversation, meeting certain needs, and cultural bonding.

Findings indicate that support networks of family groups are considered significant in relation to health issues and that reliance on family for support is important for better well-being. It was then important to investigate the association of reliance on family and beliefs regarding influenza vaccination among Caribbean-born university students, as attitude about health appears to be a predictor of being immunized (Vlahov, Coady, Ompad, & Galea, 2007) and family plays a role in the formulation of those attitudes.

Influenza Vaccinations and the Health Belief Model

The HBM was applied in this study and developed by Rosenstock (1966, 1974) and Rosenstock et al. (1988) to explain certain health belief patterns and preventive health behaviors (Shahrabani & Benzion, 2012). This theory was used because it is a

prevalent model used in studies concerning health behaviors (Chen, et al., 2011) and is a systematic method for showing relationships between health behaviors and health service use (Shahrabani & Benzion, 2012). The premise of the HBM is if an individual believes he is susceptible to a condition or disease and it could have adverse effects, then that individual would be likely to take a course of action to reduce or eliminate the susceptibility to or severity of the condition or disease. The individual also believes that taking action would outweigh the cost (Cole et al., 2009; Rosenstock et al., 1990).

In the HBM, it is the perceptions of individuals that are of interest. The key constructs of the HBM are perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy (Chen, Fox, Cantrell, Stockdale, & Kagawa-Singer, 2007). Perceived susceptibility refers to a subjective perception of the risk of contracting a disease or illness, perceived severity refers to subjective perception of the gravity or seriousness of a disease or illness, perceived benefits refers to the subjective perception of the effectiveness of a health action if it is believed that there is susceptibility to a disease or illness and perceived barriers refers to the subjective perception regarding impediments to taking recommended action in regards to a disease or illness (Rosenstock et al. 1988). The last construct, self-efficacy, as defined by Bandura (1977), is "the conviction that one can successfully execute the behavior required to produce the outcomes." Susceptibility, severity, benefits, and barriers were constructs of interest in this study as they related to cultural health beliefs and influenza vaccination.

The HBM has been shown to be applicable in studies on vaccination compliance (Chen, et al., 2007; Chen, et al., 2011; Cheney & John, 2013; Shahrabani & Benzion, 2010; Shahrabani & Benzion, 2012), yet there have not been any studies done on a population of Caribbean-born university students in regard to cultural health beliefs as possible barriers to influenza vaccination acceptance. According to the HBM, cultural health beliefs as barriers to influenza vaccination acceptance will depend on the following predictors: perceived susceptibility to influenza, beliefs about the severity/seriousness of influenza, perceived benefits of the influenza vaccination in preventing influenza, and perceived barriers to getting vaccinated (Shahrabani & Benzion, 2012).

Shahrabani and Benzion (2012) used the HBM to study susceptibility to contracting influenza, severity of influenza, perceived benefits of the vaccine, and perceived barriers to getting vaccinated and the results indicated that individuals' health beliefs about influenza vaccination can be altered due to previous experience with influenza and previous experience with influenza vaccination. Chen et al. (2007) addressed the disparity between non-Whites and Whites on influenza vaccination rates and focused on perceived susceptibility, perceived severity, and perceived barriers as the primary predictors of influenza vaccination. The findings indicated that perceived barriers predicted behavior regarding the influenza vaccination more than the other predictors. There were definite barriers in regard to influenza vaccination. African Americans and Latinos reported more barriers than Whites to getting the influenza vaccination. African American reported more mistrust issues, while Latinos reported

more cost and access issues. Cheney and John (2013) used the HBM to examine the differences in health beliefs about influenza vaccination among at-risk individuals who underused influenza vaccination. Cheney and John addressed all six constructs and found that individuals who accept versus those who resist taking influenza vaccinations have significant, but divergent differences in their health beliefs about influenza vaccination. Barriers were more evident than other constructs and the authors determined that perceived benefits and perceived barriers are pivotal areas of the model and more attention should be directed to these areas. The findings indicated that resistant individuals perceive more harm associated with vaccinations, have negative beliefs about vaccinations, and may have trust issues regarding traditional medicine and treatments. The HBM was an appropriate theoretical model for investigating the beliefs and perceptions about influenza vaccination by individuals, whether they are accepting of or resistant to influenza vaccinations, and can guide targeted approaches to address these individuals' vaccination issues.

Acculturation

Students from Caribbean countries may attend Florida International University because immigrants migrate to South Florida because of how close in culture, climate, and proximity it is to the Caribbean. This is a factor in Florida's census as the third largest immigrant populated state, second to the states of New York and California (Archibald, 2011). A question addressed was whether acculturation impacted cultural health beliefs of Caribbean-born students as it pertained to influenza vaccination.

Acculturation is the engagement of beliefs, traditions, practices and values of a majority culture by members of a minority group, in which the minority group adopts the traditions of the dominant culture. Acculturation can result in heterogeneity of cultural practices and beliefs within groups that has implications for investigating acculturation as a within group cultural factor (Hooper, Baker, Rodriquez de Ybarra, McNutt, Ahluwalia, 2012). There are many facets to acculturation when referring to health behaviors among ethnic groups and this include transnational ties to an individual's country, economic independence, and differences in migration experiences. (Lacey et al., 2015; Rahill & Mallow, 2011). Caribbean-born immigrants may face barriers when addressing healthcare issues (i.e., health beliefs and practices, stigma, immigration status) in a new country, but the issue is whether these immigrants transcend the healthcare dilemma by adopting the beliefs and practices of the new culture and dismiss the beliefs and practices of their native culture (Wheeler & Mahoney, 2008), or maintain their native cultural beliefs and practices. This issue was addressed in this study concerning Caribbean-born students' beliefs about the benefits and barriers of influenza vaccination dependent on level of acculturation.

Due to the fact that an influenza vaccination is usually administered via injection, a study of 200 Haitian immigrants, in Miami, Florida, who use injectionists called 'picuristes' was reviewed. A picuriste is recognized in the Haitian culture as similar to a doctor who administers doses of injection medicine, although the picuriste is not medically trained nor does he or she use approved prescription medicine. The majority of adult participants in the study received injections called picures and 10 of the participants

were actually picturistes. All of the participants were born in Haiti but lived in the United States for an average of 13 years. The picuristes in the interviews explained that, although they have no formal medical training, their services are requested through trust relationships between them and the individuals doing the referring. The findings suggested that the trust aspect involved in the hidden cultural health behavior of picuriste practice should be considered in culturally sensitive discussions with individuals who may not have that trust relationship with a health professional, as in instances where health professionals may be working to encourage students of Caribbean descent to take the influenza vaccination. Understanding an individual's willingness to accept an injection from a picuriste may offer some insight into willingness (or lack of) to accept an influenza injection. Lacey et al. (2015) surveyed 6082 adults, of which 1621 were of Caribbean descent, and investigated whether longer residency in the United States was linked to poorer health outcomes in the areas of substance use, physical health, mental disorders. The findings indicated that longer acculturation periods in the United States led to poorer health outcomes with each subsequent generation of Caribbean immigrants. Specifically, the physical health of the Caribbean people living in the United States showed poorer outcomes than the Caribbean people still living in their native Caribbean country. The physical conditions assessed were arthritis, dental health, diabetes, general health, and hypertension. Although influenza was not assessed in Lacey et al. (2015), the related concern was whether influenza vaccination rejection and consequently incidences of influenza infection could contribute to poor health outcomes, as the younger student-age members of Caribbean populations may not become acculturated to Westernized U.S.

beliefs and lifestyles that may positively impact their beliefs about influenza vaccination.

Rayle and Myers (2004) studied the influence of acculturation, ethnic identity, and mattering on wellness among 176 minority and 286 nonminority students in an urban, public high school. It was hypothesized that the three factors would have an influence on such areas of wellness as leisure, love, friendship, schoolwork, and self-direction. The significance of this study was that, among the minorities, ethnic identity was most strongly associated with wellness, but with both groups, positive experiences of acculturation predicted higher levels of wellness. The findings suggest that wellness, as it is a component of health, is influenced by a student's navigation of his/her own ethnic culture as well as the mainstream culture in which he/she lives, therefore acculturation should be addressed in assessing how minority students determine their paths to wellness. This path to wellness could include students' decisions about prevention methods such as influenza vaccination. This study aimed to show whether Caribbean-born university students were less likely to accept the influenza vaccination due to adhering to native cultural health beliefs and low acculturation level as opposed to being more likely to accept the vaccination due to acculturation to Westernized U.S. beliefs and lifestyle.

Researchers are investigating the effects of migrating to the United States at that critical adolescent period transitioning between childhood and adulthood and also native culture versus host culture, which can aid health professionals in addressing the needs of an immigrant, college-age group that has migrated to the United States to attend a university (Choi, 2001). Health and health care issues are associated with acculturation and it is apparent that these issues are especially prevalent among immigrants who

traverse countries, so it reasonable that these issues may require exploration from a multi-dimensional perspective. Ferguson, Iturbide, and Gordon (2014) studied ethnic identity and psychological functioning among Caribbean immigrants from Jamaica, living in the United States, in an effort to explore tridimensional (3D) acculturation. Tridimensional acculturation was described as an added dimension to the bidimensional framework of acculturation to take into consideration additional cultural experiences of minority immigrants. Ferguson et al. (2014) interviewed 80 middle-aged Jamaican immigrants in the areas of ethnic identity, acculturation, psychological distress, and life satisfaction, who juggled Jamaican, African American, and White American mainstream cultures during their daily interactions. It was found that there was an association between 3D acculturation and psychological distress and that the Jamaican participants who experienced 3D acculturation reported more stress than Jamaican participants who experienced bidimensional acculturation. It was suggested that Caribbean immigrants who experience 3D acculturation may suffer from psychological distress due to having to acculturate to their native culture in the family setting, to African American culture in a social setting, and to White American culture in the professional setting. These findings may help to understanding how acculturation affects Caribbean-born university students in their beliefs regarding vaccinations when their cultural beliefs either intersect or clash with mainstream beliefs of a host country. Information about acculturation experienced by Caribbean-born immigrant individuals can be useful when educating and communicating with these individuals about such preventive health measures as influenza vaccination and as strategies for addressing barriers are developed.

There is importance in examining acculturation in health and understanding how impactful of an influence acculturation may have on health care decisions. Cultural health beliefs influence individuals' course of reasoning and these beliefs are suggested to have a significant decision-making impact for students considering the influenza vaccination. The acculturation factors of cultural identity, ethnic identity, language competency, and cultural competency was assessed by administering the Abbreviated Multidimensional Acculturation Scales. As a result, this study drew attention to students' risk/benefit perceptions in the cultural belief areas of faith, cultural traditions, John Henryism, rejecting medication and reliance on family and the effect of acculturation. This study helped to delineate whether or not length of residence in the U.S. impacted level of acculturation that influenced beliefs about influenza vaccination. This study was intended to glean information that will lead to a better understanding of the cultural beliefs and level of acculturation that are meaningful predictors of influenza vaccination acceptance or rejection decisions among a subgroup of university students.

Chapter 3 will describe the research design, methodology, population, and recruitment procedures that was employed to test the research hypotheses.

Chapter 3: Research Method

Introduction

In chapter 3, I will delineate the research design, target population, recruitment, data collection, instrument selection, operationalization of constructs, data analysis plan, and the threats to validity for this study. The goal of this research was to determine the relationship between cultural health beliefs and perceptions about the susceptibility, severity, benefits and barriers to influenza vaccinations, and acculturation among Caribbean-born university students. I provided insight into how cultural health beliefs and level of acculturation impact health care decisions in the area of influenza vaccination use among a subpopulation of university students. The health beliefs of certain subpopulations, such as Caribbean-born university students, have not been adequately studied (Adonis-Rizzo & Jett, 2006) and addressing the evidence gap in this subpopulation of university students may contribute to the development of culturally-sensitive interventions to increase vaccination rates in this group.

The first section of this chapter includes a description of the research design and rationale for the design. In the second section the target population is described, including the population from which the sample was drawn, the sampling method, sample size, eligibility criteria for the participants and data collection. In the third section, I describe the survey instrument, process for completing the survey instrument by the study participants, and information regarding validity and reliability of the survey instrument. This section will also include operational definitions of the study constructs. The fourth section includes an explanation of the data analysis plan that addressed the research

questions. The chapter will close with information regarding the validity and ethical considerations of this research.

Research Design and Rationale

An Internet-based quantitative survey method approach was used in this study. I determined the magnitude of the relationship between cultural health beliefs, perceived barriers and the influenza vaccination. Self-report questionnaires were used to explore beliefs about influenza vaccination, cultural health beliefs, and acculturation. The Health Belief Model Scale (Champion, 1984) was used to measure susceptibility, seriousness/severity, barriers, and benefits related to influenza vaccination. The Health Beliefs Questionnaire by Furnham (1994) was used to measure cultural health beliefs of faith, cultural traditions, John Henryism, rejecting medication, and reliance on family. The Abbreviated Multidimensional Acculturation Scale (Zea et al., 2003) was used to assess acculturation on the dimensions of cultural identity, ethnic identity, language competency, and cultural competency. The independent variable for the first and second research questions was cultural health beliefs and the dependent variables were beliefs about influenza vaccination and beliefs about perceived barriers to influenza vaccination. The independent variable for Research Question 3 and 4 was acculturation and the dependent variables were cultural health beliefs and beliefs about perceived barriers to influenza vaccination. A quantitative method is easily replicable and was used to generate a simple numeric measure of the association between the independent variables and the dependent variables (Thamhain, 2014).

Due to the fact that institutions of higher learning can potentially be epicenters for influenza outbreaks because of the large concentrations of students, it was paramount to assess the beliefs of university students regarding influenza vaccination. Exploring the following research questions and testing the hypotheses aided in such as assessment:

1. RQ1 – Were cultural health beliefs predictive of beliefs about influenza vaccination among Caribbean-born university students?

$H_0$1: Cultural health beliefs were not predictive of influenza vaccination among Caribbean-born university students.

H_a1: Cultural health beliefs were predictive of influenza vaccination among Caribbean-born university students.

2. RQ2 - Were cultural health beliefs predictive of beliefs about perceived barriers to influenza vaccination among Caribbean-born university students?

$H_0$2: Cultural health beliefs were not predictive of beliefs about perceived barriers to influenza vaccination among Caribbean-born university students.

H_a2: Cultural health belief were predictive of beliefs about perceived barriers to influenza vaccinations among Caribbean-born university students.

3. RQ3 – Was level of acculturation predictive of cultural health beliefs among Caribbean-born university students?

$H_0$3: Level of acculturation was not predictive of cultural health beliefs among Caribbean-born university students.

H_a3: Level of acculturation was predictive of cultural health beliefs among Caribbean-born university students.

4. RQ4 – Was level of acculturation predictive of beliefs about perceived barriers to influenza vaccination among Caribbean-born university students?

H□4: Level of acculturation was not predictive of beliefs about perceived barriers to influenza vaccination among Caribbean-born university students.

H□4: Level of acculturation was predictive of beliefs about perceived barriers to influenza vaccination among Caribbean-born university students.

Methodology

Population

A total of 210 International students enrolled at FIU full- or part-time, undergraduate or graduate were invited to participate in the study via e-mail. Study participants were stratified on such demographic data as age, race/ethnicity, gender, and length of time in the United States.

The survey was e-mailed to the FIU students who were categorized as international students and reported their place of origin as any one of the over 32 Caribbean countries, which included Bermuda, Bahamas, Cuba, Cayman Islands, Jamaica, Turks and Caicos Islands, Haiti, Dominican Republic, Puerto Rico, British Virgin Islands, U.S. Virgin Islands, Anguilla, St. Maarten, Saba, St. Barthelemy, St. Eustatius, Barbuda, St. Kitts-Nevis, Antigua, Dominica, Montserrat, Guadalupe, Martinique, St. Lucia, St. Vincent & The Grenadines, Barbados, Grenada, Trinidad & Tobago, Bonaire, Curacao, Aruba, French Guyana, Guyana, Suriname, and Belize, (Premdas, 2011). The assistance of the International Students and Scholars Service (ISSS) Department was enlisted to e-mail the surveys to the targeted students. Approval

of the institutional review board (IRB) of Walden was required prior to data collection. Approval by FIU IRB was not required as an anonymous survey and no access to student information did not require IRB approval.

Sample Size

A power analysis was calculated at an alpha level of $p<.05$ and 80% confidence level to determine that a sample size of 89 was needed (Danielsoper.com, 2017). In an attempt to get the minimum number of 89 participants, the questionnaire was sent to the total population of 210 FIU international students who reported their place of origin as any one of the over 32 Caribbean countries. A medium effect size of $f^2=.15$ was used because a smaller than medium effect size from the independent variable would have been too small to be significant. In determining the statistical power associated with the tests of hypotheses, consideration was given to the likelihood of correctly rejecting the null hypotheses (APA, p. 30, 2010).

Recruitment and Participation

FIU international students, full or part time, who reported their place of origin as any one of the over 32 Caribbean countries, were emailed and invited to participate. During the spring 2018 semester, 2,500 of the 55,000 enrolled at FUI were international students, of which 210 were from Caribbean countries. The participants who fit the criteria were 18 years of age or older and capable of making informed independent decisions, as was stated on the consent letter with attached link to the survey. Approval was given from Walden IRB. The assistance of FIU ISSS department was enlisted in order to have the survey e-mailed through their departmental list serve, without me

needing any identifying information such as student names, FIU Panther IDs (university identification), or email addresses. The assistance of the ISSS department eliminated the exposure of such student information to individuals who did not normally have departmental access to such information. This method excluded me from having access to secure confidential student identifying information that would have required additional security. A secure email mailbox was created where the results of the completed surveys were forwarded minus any identifying information. A 30 to 45-day timeframe for survey submission was be established, in order to have an end-of-survey date, at which time data analysis begun. Two weeks after the beginning of the study, the ISSS department emailed a reminder consent letter to those students who had not submitted a survey. Students were allowed to complete the survey only one time. I was the sole researcher for this study. Collected data were stored electronically, to protect confidentiality of information, in a file on a password protected computer. Data will be kept for 5 years.

Instrumentation

The demographic information page was the first page of the survey instrument (See Appendix A). This instrument begun with questions regarding the following basic demographic items: age, gender, race/ethnicity, language preference, parent's place of birth, place of birth – specific Caribbean country, place where raised, and health status.

Health Belief Model Questionnaire

Part 1 of the data collection instruments was a validated Health Belief Model (HBMQ) questionnaire developed by Champion (1984) and modified by Kwong et al. (2009) in their study on factors affecting influenza vaccine uptake. The 25-item survey

collected data on beliefs about perceived susceptibility, severity, benefits, and barriers regarding influenza and influenza vaccination. The survey, adopted by Kwong et al. (2009), included minor modifications of a few subscale items that measured perceived susceptibility (five items), perceived severity (six items), perceived benefits (five items), and perceived barriers (nine items). A few questions pertaining to perceived susceptibility included, "My age group makes me more likely to get the flu," I am worried about the likelihood of getting influenza in the near future," and "Getting influenza is currently a possibility for me." The questions regarding perceived severity included, "Influenza is a very serious disease," I am afraid of getting the flu," and "complications from influenza are serious." Regarding perceived benefits, the survey asked such questions as, "Vaccination prevents me from catching the flu," Vaccination decreases my chance of getting the flu or its complications," and "If I get vaccinated and still get the flu, I will not be as sick with it." Items under perceived barriers included, "The influenza vaccination is painful." "Being vaccinated against influenza cannot prevent me from getting influenza," and "I am scared of needles." The participants were required to respond to each question on a 7-point Likert scale with 1 = *strongly disagree*, 2 = *somewhat disagree,* 3 = *disagree*, 4 = *neutral,* 5 = *agree,* 6 = *somewhat agree,* and 7 = *strongly agree*. The total score was calculated by summing the scores of the subscales and a sample mean was calculated. The higher the total score obtained, the higher the perceived beliefs of the participant.

Kwong et al. (2009) interviewed 30 outpatient subjects on two separate occasions in order to obtain test-retest reliability coefficients of the HBMQ scales and Pearson's

coefficient was calculated for the summative scores of each subscale. The Pearson's coefficients were as follows: perceived susceptibility $\acute{\rho}$=0.83, perceived severity $\acute{\rho}$=0.87, perceived benefits $\acute{\rho}$=0.91, perceived barriers $\acute{\rho}$=0.82. The Cronbach's alpha coefficients were calculated to test internal consistency and the subscales scores were: perceived susceptibility α=0.69, perceived severity α=0.71, perceived benefits α=0.65, and perceived barriers α=0.65. Kwong et al. stated that the content validity and reliability of this HBMQ was good.

Chen, et al. (2011) applied the HBMQ to investigate factors that influenced a caregiver's decision to vaccinate a child. The HBMQ scale was a component of a 3-part questionnaire and contained 19 items in five subscales. The subscales were perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and cues to action. The validity of the questionnaire was evaluated by a panel of experts in related public health and medical fields for clarity of the questions, importance of each question, and appropriateness of the items. The face validity was tested using a cohort of 10 subjects with characteristics similar to the proposed participants. Scores for each of the subscales were calculated and divided by the number of subscale items, with high scores obtained indicating high levels of construct validity. Cronbach's alpha calculated to assess internal consistency were as follows: perceived susceptibility α=0.82, perceived severity α=0.81, perceived benefits α= 0.74, and perceived barriers α=0.82.

Cheney and John (2013) used a HBMQ to investigate at-risk individuals, who were resistant to influenza vaccination, to determine the differences in beliefs about influenza vaccination. There were a varied number of independent variables used to

specify the HBMQ constructs – perceived susceptibility (one variable), perceived severity (three variables), perceived benefits (nine variables), perceived barriers (23 variables), but reliability and factor analyses were only conducted on the perceived benefits and perceived barriers variables due to the large number of variables specifying these constructs. Responses under perceived benefits were summed across the variables to create a perceived benefits scale and found to be highly reliable with a Cronbach alpha of α=.90. The same was done with the variables under perceived barriers, although subvariable scales (access barriers, perceived harm, belief barriers, mistrust) were developed and each scale's reliability tested. The Cronbach alpha ranged from α=.66 to α=.84.

Health Belief Questionnaire

Part 2 of the data collection instrument was a Health Belief Questionnaire (HBQ), that consisted of 80 questions in each of five cultural belief categories – *faith, cultural traditions, John Henryism, rejecting medication, and reliance on family*. The Health Belief Questionnaire (Furnham, 1994) consisted of questions that assessed individual beliefs about illness and health issues. Faith was referred to as the belief that God, and not traditional treatment, has control over health. Cultural traditions were referred to as the belief that cultural wisdom and traditions influence health behavior and treatment adherence. John Henryism referred to the belief that an individual has physical and mental control over his or her own health and can rely on inner strength to resolve environmental stressors. Rejecting medication reflected the belief of adhering to folk or alternative medicine for health management and treatment, as opposed to traditional

medicine. Reliance on family reflected the dependence on friends or family for advice and support regarding health issues as opposed to accessing traditional mental health or medical treatment (Cole et al., 2009). The questions were grouped in each of the five categories and participants were required to respond on a 7-point Likert scale with 1 = *strongly disagree*, 2 = *somewhat disagree,* 3 = *disagree*, 4 = *neutral,* 5 = *agree,* 6 = *somewhat agree,* and 7 = *strongly agree*. Scores were summed for each category, and a total score was calculated by summing the scores of all categories. The higher the score in each category, the stronger the individual's cultural belief in that category, and the higher the total score, the stronger the individual's overall cultural beliefs. Cole et al. (2009) found the subscales to have adequate internal consistency with Cronbach's alpha of: Faith α=.771, Cultural Tradition α=.838, John Henryism α=.759, Rejecting Medication α=.838, and Reliance on Family α=.657.

Abbreviated Multidimensional Acculturation Scale

Part 3 of the data collection instrument was the Abbreviated Multidimensional Acculturation Scale (AMAS) that consisted of 42 questions in the categories of cultural identity (six questions), ethnic identity (six questions), language competence (18 questions), and cultural competency (12 questions) (Zea et al., 2003). The AMAS is a multidimensional and bilinear scale that has been validated with college and community populations. The development of the scale was based on a model of acculturation that suggested that cultural identity and cultural competence are different entities because an individual may be competent within a specific culture, but not identify with that culture, and conversely, not be quite competent within a specific culture, yet identify with that

culture (Zea et al., 2003). Cultural identity questions included, "I feel that I am part of U.S. American culture," and ethnic identity questions included, "Being a member of my (culture of origin) plays an important part in my life." A language competency question was "How well do you speak your native language with…?" and a culture competency question was "How well do you know…?" Likert-type responses on the cultural and ethnic identity subscale ranged from 1 = *strongly disagree* to 4 = *strongly agree* and responses on the language and cultural competency subscale ranged from 1 = *not at all* to 4 = *extremely well/like a native*. A level of acculturation score was obtained by adding the scores on each of the two subscales and averaging those scores. Scores potentially ranged from 1 to 4. This scale was administered to a college population of 156 Latino/Latina students and found to be reliable with a Cronbach alpha coefficient ranging from α = .90 to .97. The scale was also administered to a community sample of 90 Central American immigrants living in Washington D.C. and found to be reliable at Cronbach alpha coefficient ranging from α = .83 to .97 (Zea et al., 2003).

Data Collection

Data collection begun spring 2018 upon Walden IRB approval of the proposal. Questionnaires along with an introductory/consent letter were e-mailed to prospective FIU students, who are categorized as international students and reported on their university application that their place of origin was one of the over 32 Caribbean countries listed in Chapter 2. Procedures for obtaining student information and emailing study surveys to prospective students were delineated under *Recruitment and Participation.* Data collection was via an Internet-based survey, using Qualtrics survey

program, and completed surveys sent to a secure email mailbox. I was the only individual who had access to the password protected e-mail mailbox. The introductory/consent letter sent to the prospective participants included the purpose of the study, anticipated length of completing the survey, consent information, my contact information, and three screening criteria. The screening criteria was, must be (a) 18 years of age or over, (b) an enrolled FIU student, and (c) have been born in a Caribbean country/island. The expected time to complete the survey was approximately 20-25 minutes and students were able to complete he survey only one time, but could exit the survey at any time. The survey period was 72 days, with reminder e-mails sent 2 weeks after the beginning of the study only to prospective participants who had not responded. Non-responders were known only to the ISSS department member and not to me. The sample size was not adequate at the end of the 30-45 day study period, and thus extended to 72 days and prospective participants notified of the extension.

Data Analysis

Data analysis was conducted on the data collected from the surveys using the Statistical Package for Social Sciences (SPSS) software. Frequency analyses were conducted on the demographic information. Regression analyses were done to determine the relationship between cultural beliefs, beliefs about influenza vaccination, beliefs about perceived barriers to influenza vaccination, and acculturation. Surveys were examined for completeness of data and patterns of missing data. Descriptive statistics of frequencies were calculated for age, gender, racial/ethnic category, preferred language,

and length of time in the United States. The data were examined for outliers, which there were none. To test each research question, the following analyses were performed:

1. RQ1: Are cultural health beliefs predictive of beliefs about influenza vaccination among Caribbean-born university students?

Analysis 1: Linear regression analysis was conducted to determine if higher scores regarding cultural health beliefs were associated with lower scores regarding beliefs about influenza vaccination among Caribbean-born university students.

2. RQ2: Are cultural health beliefs predictive of beliefs about perceived barriers to influenza vaccination among Caribbean-born university students?

Analysis 2: Linear regression analysis was conducted to determine if higher scores regarding cultural health beliefs were associated with higher scores regarding perceived barriers to influenza vaccination among Caribbean-born students.

3. RQ3: Is level of acculturation predictive of cultural health beliefs among Caribbean-born university students?

Analysis 3: Linear regression analysis was conducted to determine if higher scores regarding level of acculturation were associated with lower scores regarding cultural health beliefs among Caribbean-born university students.

4. RQ4: Is level of acculturation predictive of beliefs about perceived barriers to influenza vaccination among Caribbean-born university students?

Analysis 4: Linear regression analysis was conducted to determine if higher scores regarding level of acculturation were associated with lower scores regarding

beliefs about perceived barriers to influenza vaccination among Caribbean-born university students.

Threats to Validity

The study was designed to ensure that the methodology and survey instruments used addressed the stated research questions. It was expected that there would be a relationship between the independent and dependent variables, but consideration was given to the possibility of alternative relationships between the independent and dependent variables. These included third variable causation (a confound variable causes an effect on the independent and dependent variable) or circular causation (can occur when changes in the variables have reciprocal effects on each other) (Cone & Foster, 2006). The relationship between cultural beliefs and beliefs about influenza vaccination could have been confounded by age and gender, but was not. Age of the respondents was a consideration for discussion as the majority of student respondents were 30+ years, which was unexpected. It was expected that there would be more 18-20-year-old students who were newly migrated to the U.S., so that there could have been a comparison of responses between those residing in the U.S. less than 2 years versus those residing in the U.S. 5+ years. There were more female than male gender students, but analyses were not done to determine any differences in responses between the two groups. The survey was programmed to ensure that a response was required of every question by not allowing final submission until all questions were answered. This ensured no missing data on completed surveys. The variables were clearly operationalized, and questionnaires were

chosen that fit the criteria for addressing the research questions and was determined appropriate for the study.

An issue of external validity was generalizability of the study findings to related Caribbean-born university populations or to such populations in other settings. Generalizability of findings to other college-age populations, other populations that may be influenced by cultural health beliefs, or populations that may have variable beliefs regarding influenza vaccination is discussed in the Discussion section. A consideration of the validity of study was to gather data from a sufficient sample size of at least 89 students to detect the expected effect and control for Type I errors. Surveys were sent to all of the 210 International students who reported their place of origin as a Caribbean country, which resulted in 98 student respondents.

Ethical Considerations

Study participants was informed in the introductory/consent letter that participation was strictly voluntary and all information confidential. The introductory letter described the study and purpose, information regarding what the participant was be asked to provide, information about the approximate length of time to complete the questionnaire, and information about benefits and potential risks (Cone & Foster, 2006). Study participants were informed of the choice to voluntarily withdraw from the study at any time before survey completion without penalty. The consent letter stated that no identifying information was to be collected and that their responses would only be used to assess the association of cultural health beliefs, perceived susceptibility, perceived severity, perceived benefits, and perceived barriers to influenza vaccination acceptance

and not to determine a person's personal risk of contracting influenza. In addition, the introduction letter included my contact phone number and the phone numbers of the dissertation chairperson, Office of Research Integrity and Compliance at Walden University and FIU IRB. After reading the introductory letter, that included informed consent and screening criteria, the participant was able to click onto the survey link at the bottom of the page to begin the survey.

Data was collected via an Internet-based survey program, Qualtrics, and all information was sent to a created password protected e-mail mailbox that only I had access to. The data was uploaded onto a personal thumb drive that was kept in a secured file drawer in my locked office. There was no identifying student information, such as name or Panther ID (university identification). There was no justifiable concealment of any information related to this study and the participants' right to decline or withdraw was respected. This study was conducted abiding by all relevant ethical principles and standards as stated by the American Psychological Association (APA) in order to be conducted competently, keeping in mind that the welfare of the participants was of primary concern (Cone & Foster, 2006).

Competence on my part as the principal researcher is justified by my educational training, research experience, and certification in 'Protecting Human Participants' issued by the National Institute of Health. In all efforts to ensure the ethical conduct of this study, clear, informed and voluntary agreement by the participants to participate in the study was obtained. All possible steps were taken to avoid deception and protect the

participants from harm or discomfort associated with participation in a study regarding their beliefs (Cone & Foster, 2006).

In summary, a quantitative survey method was used to determine the relationship between cultural health beliefs, beliefs about influenza vaccination, beliefs about perceived barriers to influenza vaccination, and level of acculturation. The HBMQ, HBM, and AMAS questionnaires were administered and regression analyses were conducted to determine if cultural beliefs predicted beliefs about influenza vaccination and beliefs about perceived barriers to influenza vaccination and if level of acculturation predicted cultural health beliefs and beliefs about perceived barriers to influenza vaccination.

Chapter 4: Results

The purpose of this research was to determine the relationship between cultural health beliefs and beliefs about influenza vaccination among Caribbean-born university students. Acculturation was considered as students' beliefs about influenza vaccination, which may also be influenced by their level acculturation in the United States. In this chapter, the results of the regression analysis of the data provided responses to the research questions regarding cultural health beliefs and influenza vaccination.

The research questions were as follows:

1. RQ1 - Are cultural health beliefs predictive of beliefs about influenza vaccination among Caribbean-born university students?

$H_0$1: Cultural health beliefs are not predictive of influenza vaccination among Caribbean-born university students.

H_a1: Cultural health beliefs are predictive of influenza vaccination among Caribbean-born university students.

2. RQ2 - Are cultural health beliefs predictive of beliefs about perceived barriers to influenza vaccination among Caribbean-born university students?

$H_0$2: Cultural health beliefs are not predictive of beliefs about perceived barriers to influenza vaccination among Caribbean-born university students.

H_a2: Cultural health belief are predictive of beliefs about perceived barriers to influenza vaccinations among Caribbean-born university students.

3. RQ3 – Is level of acculturation predictive of cultural health beliefs among Caribbean-born university students?

$H_0$3: Level of acculturation is not predictive of cultural health beliefs among Caribbean-born university students.

H_a3: Level of acculturation is predictive of cultural health beliefs among Caribbean-born university students.

4. RQ4 – Is level of acculturation predictive of beliefs about perceived barriers to influenza vaccination among Caribbean-born university students?

$H_0$4: Level of acculturation is not predictive of beliefs about perceived barriers to influenza vaccination among Caribbean-born university students.

H_a4: Level of acculturation is predictive of beliefs about perceived barriers to influenza vaccination among Caribbean-born university students.

Data were collected from 98 out of the 210 Caribbean-born university students (46.7% response rate) attending FIU during the January to April 2018 spring semester. All of the students were currently enrolled, regardless of class year, with a FIU email address at which they received the study survey. The largest age group represented was 30+ years of age (44%). The majority of the students were Black (53%) and there was a larger number of female students than male, 58% and 37% respectively (see Table 1). English was reported as the most spoken language at 65%, with Spanish second most spoken at 20%. The majority of students were born in Haiti and (32%) lived in the United States 5+ years (81%) (see Table 2). Ninety-eight of 210 (46.7%) reported Caribbean-born FIU students were surveyed. These students comprised 8.4% of the international student body (n = 2,500) and .38% of the total FIU population (n = 55,000).

Table 1

Caribbean-Born University Student Demographics

Characteristics	*N*	%
Age		
18-20	13	13.3
21-25	28	28.6
25-30	9	9.2
30+	43	43.9
Missing	5	5.1
Race/Ethnicity		
Black	52	53.1
Hispanic/Latino	28	28.6
Asian/P.Islander	2	2.0
Indian	2	2.0
Biracial/Multi.	5	5.1
Other	4	4.1
Missing	5	5.1
Gender		
Male	36	36.7
Female	57	58.2
Missing	5	5.1

Table 2

Preferred Language and Country of Birth of Caribbean-Born University Students

Characteristics	*N*	%
Preferred language		
Creole	5	5.1
English	64	65.3
English/French	1	1.0
Eng./Fren./Creole	1	1.0
French	1	1.0
Spanish	19	19.7
Spanish/English	1	1.0
Missing	6	6.1
Country of Birth		
Bahamas	2	2.0
Cuba	13	13.3
Dominica	1	1.0
Dom. Republic	6	6.2
Guyana	1	1.0
Haiti	31	31.6
Jamaica	15	15.3
Puerto Rico	3	3.1
Trinidad/Tobago	5	5.1
U.S. Virgin Island	4	4.0
Other	11	11.2
Missing	6	6.2
Time in U.S.		
Less than 2 yrs.	1	1.0
2-5 yrs.	13	13.3
5+ yrs.	79	80.6
Missing	5	5.1

Research Question 1

To examine research question 1, linear regression analysis was conducted to determine if the independent variable, cultural health beliefs, was predictive of the dependent variable, beliefs about influenza vaccination. Cultural health beliefs were measured by scores on the HBM in the areas of faith, cultural traditions, John Henryism, rejecting medication, and reliance on family. Beliefs about influenza vaccination was measured using the HBMQ in the areas of perceived susceptibility, perceived severity, perceived benefits, and perceived barriers. Preliminary analyses were performed to ensure there was no violation of the assumption of normality and linearity. The assumption of normality was assessed with a normal P-P scatterplot for the HBM (cultural health beliefs) and HBMQ (beliefs about influenza vaccination) scores. There were no outliers identified. The results of the linear regression were significant, (F (1,96) = 45.299, $p < .000$, $R^2 = .321$), suggesting that cultural health beliefs accounted for 32.1% of the variance in beliefs about influenza vaccination. It was found that cultural health beliefs were a significant predictor of beliefs about influenza vaccination ($B = .155$, $p < .000$) among Caribbean-born university students, suggesting that for every 1-point increase in cultural health belief scores on the HBM, beliefs about influenza vaccination on the HBMQ increased by .155 points. The H□ was rejected. The results showed that the higher the scores regarding cultural health beliefs, the higher the scores regarding beliefs about influenza vaccination. Therefore, the cultural health beliefs of Caribbean-born university students were not associated with lower beliefs about influenza vaccination, as hypothesized (see Tables 3 - 6).

Table 3

Regression Analysis 1 of Cultural Health Beliefs and Beliefs about Influenza Vaccination

Model	*R*	R^2	*SE*
1	.566	.321	26.304

Table 4

Regression Analysis 2 of Cultural Health Beliefs and Beliefs about Influenza Vaccination

	M	*SD*	*N*
HBMQ	90.34	31.748	98
HBM	310.05	116.113	98

Table 5

Regression Analysis 3 of Cultural Health Beliefs and Beliefs about Influenza Vaccination

Model	*SS*	*df*	*MS*	*F*	*p*
Regression	31343.290	1	31343.290	45.299	.000
Residual	66424.598	96	691.923		
Total	97767.888	97			

Table 6

Regression Analysis 4 of Cultural Health Beliefs and Beliefs about Influenza Vaccination

Model	*B*	*β*	*t*	*p*
1 (Constant)	42.337		5.563	.000
HBM	.155	.566	6.730	.000

Research Question 2

Linear regression analysis was conducted on research question 2 to determine if the independent variable, cultural health beliefs, was predictive of the dependent variable, beliefs about perceived barriers to influenza vaccination. Assumptions of normality and

linearity were assessed for beliefs about perceived barriers to influenza vaccination with a normal P-P scatterplot. The results of the linear regression supported Hypothesis 2 ($F(1,96) = 30.160$, $p < .000$, $R^2 = .239$), suggested that cultural health beliefs accounted for 23.9% of the variance in beliefs about perceived barriers to influenza vaccination. Cultural health beliefs were a significant predictor of beliefs about perceived barriers to influenza vaccination ($B = .050$, $p < .000$) among Caribbean-born university students, suggesting that for every 1-point increase in cultural health belief scores on the HBM, scores regarding the beliefs about perceived barriers to influenza vaccination item on the HBMQ increased by .050 points. The H□ was rejected. As hypothesized, higher scores regarding cultural health beliefs among Caribbean-born university students were associated with higher scores regarding beliefs about the perceived barriers to influenza vaccination (see Tables 7 - 10).

Table 7

Regression Analysis 1 of Cultural Health Beliefs and Perceived Barriers

Model	*R*	*R²*	*SE*
1	.489	.239	10.308

Table 8

Regression Analysis 2 of Cultural Health Beliefs and Perceived Barriers

	M	*SD*	*N*
Barriers	26.56	11.756	98
HBM	310.05	116.113	98

Table 9

Regression Analysis 3 of Cultural Health Beliefs and Perceived Barriers

Model	*SS*	*df*	*MS*	*F*	*p*
Regression	3204.919	1	3204.919	30.160	.000
Residual	10201.214	96	106.263		
Total	13406.133	97			

Table 10

Regression Analysis 4 of Cultural Health Beliefs and Perceived Barriers

Model	*B*	*β*	*t*	*p*
1 (Constant)	11.212		3.759	.000
HBM	.050	.489	5.492	.000

Research Question 3

To examine research question 3, linear regression analysis was also conducted to determine if the independent variable, level of acculturation, was predictive of the dependent variable, cultural health beliefs. Acculturation was measured using the AMAS scale that measured cultural identity, ethnic identity, language competency, and cultural competency. Assumptions of normality and linearity were met for AMAS scores. The results showed a significant linear regression F (1,96) = 99.459, $p < .000$, $R^2 = .509$, suggesting that level of acculturation accounted for 50.9% of the variance in cultural health beliefs. It was found that level of acculturation was a significant predictor of cultural health beliefs ($B = 68.8$, $p < .000$) among Caribbean-born university students, indicating that each 1-point increase regarding level of acculturation measured by the AMAS, cultural health beliefs scores on the HBM increased by 68.8 points. The H□ was

rejected. It was hypothesized that the higher the level of acculturation scores, the lower the cultural health belief scores, but the results showed that the level of acculturation among this population of Caribbean-born university students did not lower their cultural health beliefs (see Tables 11 -14).

Table 11

Regression Analysis 1 of Acculturation and Cultural Health Beliefs

Model	*R*	R^2	*SE*
1	.713	.509	81.797

Table 12

Regression Analysis 2 of Acculturation and Cultural Health Beliefs

	M	*SD*	*N*
HBM	310.05	116.113	98
AMAS	2.929	1.2035	98

Table 13

Regression Analysis 3 of Acculturation and Cultural Health Beliefs

Model	*SS*	*df*	*MS*	*F*	*p*
Regression	665455.285	1	665455.285	99.459	.000
Residual	642313.460	96	6690.765		
Total	1307768.745	97			

Table 14

Regression Analysis 4 of Acculturation and Cultural Health Beliefs

Model	*B*	*β*	*t*	*p*
1 (Constant)	108.504	21.833		.000
AMAS	68.821	6.901	.713	.000

Research Question 4

A final linear regression analysis was conducted on research question 4 to determine if level of acculturation was predictive of beliefs about perceived barriers to influenza vaccination. A significant regression equation F (1,96) = 27.153, $p < .000$ was found, with a $R^2 = .220$, suggesting that level of acculturation accounted for 22.0% of the variance in beliefs about perceived barriers to influenza vaccination. It was found that level of acculturation was a significant predictor of beliefs perceived barriers to influenza vaccination ($B = 4.59$, $p < .000$) among Caribbean-born university students, indicating that for each 1-point increase in level of acculturation scores on the AMAS, beliefs about perceived barriers to influenza vaccination scores on the perceived barrier item of the HBMQ increased by 4.59 points. The H□ was rejected. Results showed that higher scores regarding level of acculturation were associated with higher scores regarding beliefs about perceived barriers to influenza vaccination, which was contradictory to the hypothesis that the more acculturated the Caribbean-born university students were, the less they would believe in perceived barriers to influenza vaccination (see Tables 15 - 18).

Table 15

Regression Analysis 1 of Acculturation and Perceived Barriers

Model	*R*	R^2	*SE*
1	.470	.220	10.433

Table 16

Regression Analysis 2 of Acculturation and Perceived Barriers

	M	*SD*	*N*
HBM	26.56	11.756	98
AMAS	2.929	1.2035	98

Table 17

Regression Analysis 3 of Acculturation and Perceived Barriers

Model	*SS*	*df*	*MS*	*F*	*p*
Regression	2955.788	1	2955.788	27.153	.000
Residual	10450.345	96	108.858		
Total	13406.133	97			

Table 18

Regression Analysis 4 of Acculturation and Perceived Barriers

Model	*B*	*β*	*t*	*p*
1 (Constant)	13.129		4.714	.000
AMAS	4.587	.470	5.211	.000

Cultural health beliefs of this population of Caribbean-born university students were associated with higher beliefs regarding influenza vaccination and beliefs about perceived barriers to influenza vaccination than hypothesized, although cultural health beliefs were more significantly predictive of beliefs regarding influenza vaccination (in general) than of beliefs about perceived barriers to influenza vaccination (specifically). As the cultural health beliefs of Caribbean-born university students increased, so did their

beliefs about influenza vaccination and beliefs about perceived barriers to influenza vaccination.

Level of acculturation was associated with higher cultural health beliefs and beliefs about perceived barriers to influenza vaccination than predicted. Level of acculturation was significantly more predictive of cultural health beliefs than of beliefs about perceived barriers to influenza vaccination among these students. Contrary to prediction, as the level of acculturation of Caribbean-born university students increased, so did their cultural health beliefs and beliefs about perceived barriers to influenza vaccination.

The implications and contributions of this research to knowledge about cultural health beliefs and influenza vaccination as it relates to Caribbean-born university students will be discussed in the next chapter.

Chapter 5: Discussion

This research filled a gap in understanding cultural health beliefs maintained by Caribbean-born university students, after migration to the United States, that may act as barriers to the acceptance of influenza vaccination. The study results were consistent with literature that stated concepts of health are shaped by cultural groups that influence how health is perceived (Ravindran & Myers, 2012) and that cultural beliefs impact decision making regarding health issues (Berkman, Davis, & McCormack, 2010; Evans et al., 2009). The objective was to examine these concepts of health among Caribbean-born university students due to increased interest in decisions regarding acceptance or rejection of influenza vaccination among populations at IHE (Poehling et al. 2012) and the prevention of an influenza outbreak, especially after the H1N1 outbreak of 2009. The prevention of an influenza outbreak at IHE continues to be of utmost importance in efforts to maintain infection control and academic stability, especially among college-age groups that believe they are not likely susceptible to an influenza pandemic, despite being a highly susceptible group in pandemics prior to the H1N1 pandemic of 2009 (Van et al., 2010). Outbreaks of influenza amongst university populations have resulted in increased clinic visits, lack of classroom attendance, and decreased academic performance, which have caused a burden to universities responsible for maintaining healthy students (Seale et al., 2012). To avoid outbreaks and widespread transmission of influenza, influenza vaccination is the most effective prevention strategy and this vaccination is highly recommended for university populations (CDC, 2015; DiClemente et al., 2012); yet, the vaccination continues to be underused by the population who would most benefit from it

(Cheney & John, 2013). Although the influenza vaccination is recommended for preventive care, the cultural beliefs about the perceived barriers to the vaccination among the students in this study appears to be influencing their disregard for preventive care. Wheeler and Mahoney (2008) found that a challenge to Caribbean immigrants regarding the use of health care services in the United States is the retention of their belief practices that leads to being reactive instead of proactive in addressing health problems, which undermines the need for preventive care. This preventive care may include influenza vaccination. As vaccination is described by Todorova (2014) as a technology that has complex cultural dimensions and elicits a range of cultural and personal meanings, it was of interest to determine the association of these cultural dimensions to personal health beliefs about influenza vaccination that may help to understand influences on vaccination decisions among this understudied population of Caribbean-born students on a university campus.

Addressing Hypotheses 1 and 2, although cultural beliefs accounted for more of a variance in beliefs about influenza vaccination than perceived barriers to influenza vaccination. Cultural beliefs were not associated with lower beliefs about influenza vaccination, as hypothesized, but cultural health beliefs were found to be associated with perceived barriers, as hypothesized. Cultural beliefs accounted for 32.1% of the variance in beliefs about influenza vaccination and 23.9% of the variance in perceived barriers to influenza vaccination. The beliefs about influenza vaccination included perceived susceptibility, perceived severity, perceived benefit, and perceived barrier. It was expected that these university students would score higher regarding the association of

cultural health beliefs and perceived barriers to influenza vaccination as collective studies (Byrne et al., 2012; Cole et al., 2015; Seale et al., 2012) found that university students perceived influenza vaccination to be high risk and low benefit, and high perceived barriers to taking the vaccination, which indicates these factors contribute to negative beliefs and low acceptance of the influenza vaccination by these students. A question of interest was whether Caribbean-born university students would report effects of perceived barriers to influenza vaccination similar to university students in other studies that were not Caribbean-born and it was found that similar results occurred. In the present study, cultural health beliefs counted for 23.9% of the variance in perceived barriers to influenza vaccination, which compared to the 29% variance of intention to vaccinate on perceived barriers in Byrne et al. (2012). Cole et al. (2015) also found a 38% variance of vaccination decision on barriers (e.g. vaccine affordability, clinic location, flu shot frequency) and determined that cognitive appraisals were significant when making decisions about influenza vaccination. Cheney and John (2013) found that when assessing the constructs of the health belief model, barriers were more evident than the other constructs, as it was in this study, and that those who accepted versus those who resisted the influenza vaccination had significant but divergent differences in health beliefs about influenza vaccination. The similar results between studies lend to another question as to whether the health beliefs about perceived barriers to influenza vaccination among Caribbean-born university students versus university students in general are due to assimilation of negative beliefs about influenza due to association or are there

significant divergent differences in beliefs based on culture within university populations. This may be an area for future study, which I will address later in the chapter.

This findings also provided additional understanding of the influence of level of acculturation on influenza vaccination beliefs among this population of university students. In reference to Hypotheses 3 and 4, level of acculturation as it pertained to cultural health beliefs and perceived barriers to influenza vaccination showed that acculturation accounted for 50.9% of the variance in cultural health beliefs and 22 % of the variance in perceived barriers to influenza vaccination. By comparison, level of acculturation showed to be no more predictive of perceived barriers to influenza vaccination than cultural health beliefs of perceived barriers to influenza vaccination (22% and 23% respectively). The level of acculturation being predictive of cultural health beliefs may be explained by the 53% of students who reported being more a member of their culture of origin than being U.S. American, albeit the majority of students reported residing in the Unites States 5+ years. The exact number of years residing in the United States was not asked, but the majority of students (80.6%) who reported residing in the United States 5+ years appeared to maintain a level of acculturation not necessarily conducive to acceptance of the influenza vaccination, lending support to the studies of people immigrating to the United States who do not adopt the health practices of the new country but may maintain traditional health practices and beliefs (Lacey et al., 2015; Rahill & Mallow, 2011; Wheeler & Mahoney, 2008). It is possible that contextual factors, such as the cultural attributes of the new country and the degree and rate of acculturation, may have affected the students' exposure to U.S. health practices that may

have had a negative impact on their beliefs about the influenza vaccination and decisions regarding the influenza vaccination (Lacey et al., 2015). Although the majority of these Caribbean-born students have resided in the United States for 5+ years, they have retained certain health beliefs of their native culture, indicating that residing in a host country does not translate to relinquishment of original traditions or beliefs (Archibald, 2011; Choi, 2001). The majority of Caribbean-born students studied was of Haitian descent (31.6%), many Haitian people believed that influenza is the "big cold" and can be treated with natural traditional remedies (Adonis-Rizzo & Jett, 2006). Therefore, many of these Caribbean-born students of Haitian descent may still hold to cultural beliefs that have existed for generations of using natural traditional remedies to treat illness as opposed to accepting an influenza vaccination. In addition, many Caribbean immigrants migrate to the state of Florida due to its proximity to the islands and the state is the third largest of immigrant populations (Archibald, 2011), so it is plausible that it would not be difficult to maintain cultural traditions and beliefs in densely populated, culturally conducive communities.

Adonis-Rizzo and Jett (2006) concluded that integration of western medicine (i.e., influenza vaccination) and traditional medicine (i.e., herbal remedies) may be one approach to increasing immunization rates among a Caribbean population. The results showed that these students held beliefs about perceived barriers to the influenza vaccination and after 5+ years of acculturation in the United States, they still held cultural beliefs and perceived barriers to influenza vaccination that contributes to their lack of acceptance of the vaccination. As in other studies on vaccination rates and the underuse

of influenza vaccination using the Health Belief Model (Shahrabani & Benzion, 2012; Chen et al., 2007; Cheney & John, 2013), the results of this study indicated that perceived barriers were more evident than other constructs of the model and added information to the previous findings that resistant individuals perceive more harm associated with vaccinations, have negative beliefs about vaccinations, and have trust issues regarding traditional medicine and treatments.

Future Study

Although beyond the scope of this study, future study could follow acculturation progression of these students to determine if persons who immigrate to the U.S. adopt the health-related beliefs and attitudes to become "Americanized" (Ferguson, Iturbide, & Gordon, 2014: Lacey et al., 2015) and how this impacts later decisions about influenza vaccination. Ferguson et al. (2014) discussed tridimensional acculturation (the integration of three cultures by minority immigrants) as it affected ethnic identity and psychological functioning and the stress related to the multicultural demands. Caribbean immigrants who experience tridimensional acculturation may suffer from psychological distress due to having to acculturate to their native culture in the family setting, to African American culture in a social setting, and to White American culture in the professional setting. As many Caribbean immigrants may experience this acculturation phenomenon, it would be of interest to determine the influence of this dimension of acculturation on Caribbean-born students in relation to cultural beliefs and decisions regarding influenza vaccination.

Limitations

A limitation to this study is the generalization of results to U.S. university populations that are not of Caribbean origin, as cultural beliefs may be different, and the acculturation factor may have varying effects. A second limitation is that the majority of students surveyed reported being from Haiti and Jamaica, with few students being from many of the other 30 Caribbean countries, therefore limiting the reporting of cultural beliefs of a variety of Caribbean-born students. Haitians and Jamaicans make up the largest Caribbean populations in South Florida (U.S. Census, 2014), therefore it was not uncommon to have a large number of students from those countries surveyed. The third limitation is the generalizability of study results to a freshman population of university students, as the majority of surveyed students were in the 30+ age group. An assumption is that the 30+ age group may more likely be upper classmen or graduate students who were more diligent in responding to university e-mails than the younger, newly acclimating freshman or sophomore students. It may have been of interest to ask if the students had ever received an influenza vaccination or had ever considered receiving one.

Recommendations

The information gained from this study gives credence to the need for designing health interventions and health messages on influenza vaccination that are culture specific for a college-age population, if influenza vaccination acceptance is to be promoted. Assessment of the target population's beliefs and perceptions about influenza vaccination should be a primary concern (Cameron et al., 2009; Yang, 2012) along with developing health education messages that promote healthy behaviors (Akan et al., 2010)

and the importance of infection control (Van et al., 2010). Well-rounded programs that address various cultural health beliefs and barriers among groups, such as Caribbean-born university students, would be effective in addressing the health needs of this group. Influenza vaccination promotion strategies include education through such venues as social media, university sporting events, and university-wide influenza education campaigns (Poehling et al., 2012). A multifaceted approach could include posting announcements in residence halls, at Caribbean student clubs and other academic settings, and at Caribbean student-attended events where these students are more likely to socialize and be influenced by other students like themselves that may have received the influenza vaccination. Pastor-Sattoras and Vespignani (2002) showed that factors that influenced and minimized the likelihood of an epidemic at a university were the immunization of socially connected students and targeting students from different classification levels, including students on and off campus.

Future exploration of this issue could include administration of an initial survey at the time of immigration to the United States and re-administered at intervals during the acculturation period, in order to determine changes in cultural health beliefs and beliefs about influenza vaccination. Studies could also be conducted on the health beliefs of Caribbean-born students before and after exposure to influenza-related educational messages or interventions that emphasize health maintenance and infection control as it relates to academic performance. It is beneficial to understand the dynamics of cultural beliefs and health behavior in order to address health care issues (Aronowitz, Deener, Keene, Schnittker, & Tach, 2015) as they relate to influenza prevention and vaccination

among understudied ethnic populations, such as Caribbean-born university students. These students are a part of the university culture.

Conclusion

Preventive health promotion, communication, and cultural awareness strategies could support influenza vaccination acceptance and encourage informed decision making about this disease. In the interest of globalization and diversity, it behooves health professionals addressing university student needs to use information in studies such this to develop frameworks for serving international student populations who have emigrated from such regions as the Caribbean.

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Appendix A: Demographic Form

Instructions: Please put a check next to your response to each of the following questions:

1. **What is your age?** 18-20 ____ 21-25 ____ 25-30 ____ 30+ _____

2. **What gender do you identify with?**
   Male ____ Female ____ Transgender ____ Other _____

3. **What racial or ethnic group do you identify with?**
   Black ____ Hispanic or Latino ____ White ____
   Asian/Pacific Islander ____ Indian ____ Biracial/multiracial ____ Other _____

4. **What language do you prefer to speak?**
   _____

5. **Where either or both of your parents born in the United States?**
   Yes_____ No_____

6. **What is the Caribbean country where you were born?**
   _____

7. **Where were you raised? (specify country)**
   _____

8. **How would you rate the status of your health?**
   Poor ____ Fair ____ Good ____ Excellent ____

9. **Length of time that you have lived in United States?**
   Less than 2 years ____ 2-5 years ____ 5+_____

Appendix B: Health Belief Model Questionnaire

All items are answered on a 7-point Likert scale: Strongly disagree, somewhat disagree, disagree, neutral, agree, somewhat agree, strongly agree.

PERCEIVED SUSCEPTIBILITY. These questions pertain to your beliefs about how likely you think/feel you are to getting the flu.

1. My chance of getting the flu in the next few months is great.
2. My age group makes me more likely to get the flu.
3. I am worried about the likelihood of getting the flu in the near future.
4. Getting the flu is currently a possibility for me.
5. My physical health makes me more likely to get the flu.

PERCEIVED SEVERITY. These questions pertain to your beliefs about how serious you think/feel the flu is.

1. Influenza (flu) is a very serious disease.
2. I will be very sick if I get the flu.
3. If I get the flu, my usual activities will change.
4. I am afraid to even think about being sick with the flu.
5. I am afraid of getting the flu.
6. Complications from the flu are serious.

PERCEIVED BENEFITS. These questions pertain to your beliefs about the benefits of the influenza (flu) vaccination.

1. Vaccination prevents me from catching the flu.
2. Vaccination is a good idea because I feel less worried about catching the flu.
3. Vaccination decreases my chance of getting the flu or its complications.
4. If I get vaccinated, I will decrease the frequency of medical consultation.
5. If I am vaccinated and still get the flu, I will not be as sick with it.

PERCEIVED BARRIERS. These questions pertain to your beliefs about not getting the influenza (flu) vaccination.

1. The flu vaccination is painful.
2. The side effects of flu vaccination interfere with my usual activities.
3. Being vaccinated against the flu cannot prevent me from getting the flu.
4. I am scared of needles.

5. It is too expensive to get the flu vaccination.
6. I am too busy to get flu vaccination.
7. I cannot be bothered to get flu vaccination.
8. The side effects of flu vaccination are worse than the flu.
9. The flu vaccination is held at an inconvenient location.

Appendix C: Health Belief Questionnaire

All items are answered on a 7-point Likert scale: Strongly disagree, somewhat disagree, disagree, neutral, agree, somewhat agree, strongly agree.

These questions pertain to your cultural beliefs regarding:

FAITH

1. When I'm ill, whether I get better quickly or slowly is largely a matter of luck.
2. God has given me the means by which to improve my health.
3. Illness is a fact of life – I cannot expect to go through life without ever becoming ill, or without risk of disability.
4. The speed of my recovery from an infection depends a lot on the virulence of the disease organisms causing it.
5. I believe that God watches over my health.
6. When I'm ill, I have faith in my body's mechanisms to promote recovery and restore good health.
7. When I'm ill, there is very little I can do for myself which will help me to get better fast.
8. Being able to achieve a better standard of health is not really influenced at all by what is going on in my life at the time.
9. There are many times when God send me ill health for a reason I may not be able to understand.
10. How well or ill I am is seldom, if ever, just a matter of chance.
11. No amount of praying on my part could physically affect my recovery, if I was ill.
12. I believe that faith healing could work for me.
13. Faith healing can bring about a cure where conventional medicine fails.

CULTURAL TRADITIONS

1. My becoming ill is seldom, if ever, the result of exposure to noxious substances in the day-to-day environment (e.g. food additives, pollution, industrial waste).
2. When I'm ill, I usually feel as though I'm in some way to blame.
3. I believe I could become ill through a curse or ill-wishing on the part of another person.
4. The physical conditions of my life (e.g. my working environment, my housing situation) do not affect my general state of health.
5. My state of overall health is in part a product of my economic resources – how "well off" or "badly off" I am.
6. In order to become healthier, I would need to marshal my body's own natural capacities.

7. My falling ill can be weakness of will – I don't always have the power of mind to fight off disease.
8. Being exposed to crowded conditions (e.g. public transport) can lead to me catching a disease.
9. The constitution with which I was born has little, if any, influence on my day-to-day state of health.
10. I see illness as a challenge to be overcome – a determined attitude on my part can speed my recovery.
11. Illness is often a simple matter of being attacked by disease – nothing more complicated than that.
12. My state of health at any point in time reflects what is going on in my health – some of the things that happen will improve it, some make it worse.
13. Sometimes I get ill because of my own stupid behavior.
14. I believe that there are people with powers of a "healer", who could cure me were I to become ill.
15. I feel I have a right to choose whether or not to act in ways that harm my health (e.g. work too hard, or smoke).
16. Illness can be caused by the external environment – my being somewhere that is cold and damp, for example.
17. A lot of times when I am ill, I use my own common sense to work out what to do to treat it.
18. By attuning myself to nature itself – to the "power for good" in the Universe, I can improve my health.
19. Being healthy is a product of lifestyle as a whole – only by living a healthy lifestyle can I ensure that I'm fit and well.
20. When I'm ill, I believe I should seek deep within myself for the reason – by tackling the inner motivations and pressures, I can find ways to get better.

JOHN HENRYISM (a concept of strength and endurance)

1. I believe I may have certain built-in weaknesses which make me vulnerable to particular illness or disorders.
2. To improve my health would require improvements in the environment in which I live.
3. I see my body as rather like a machine, how well or how badly it is running determines my state of health.
4. When I'm ill, my recovery is influenced by the quality and comfort of my surrounding.
5. Some of the time I'm likely to be healthy, some of the time ill. My state of health is often just a matter of how the probabilities stack up.

6. State of mind is a crucial part of my achieving better health-by promoting positive feelings of contentment and fulfillment in myself, I can enhance my state of physical health.
7. How well or badly I look after myself generally has an influence on my overall health.
8. My ability to achieve a better standard of health is affected by whether my life circumstances are helpful or unhelpful.
9. When I feel unhappy, I'm more likely to become ill.
10. If I'm going to get ill, then I will get ill – it's just the luck of the draw.
11. It's a matter of luck whether or not my health will improve.
12. Sometimes when I get ill, it's a result of long-term pressures in the circumstances of my life.
13. Sudden stressful life events (e.g. bereavement, moving house, losing my job) can have the effect of making me ill.
14. Emotional distress can upset my general health.
15. When my state of health is poor, it is often my own bad habits that are to blame.
16. Recovery from illness is, as much as anything, a matter of odds – there's a certain probability I'll get better sooner or later, and a certain probability that I won't.
17. My overall state of health has a lot to do with my day-to-day actions-I can allow myself to get run down or take steps to keep healthy.
18. Maintaining my health is somewhat of an uphill struggle, given the polluted, stressful, exploitative society in which we live.
19. I feel I have the state of overall health I deserve.
20. My physical health and well-being are affected by my state of mind.
21. My own actions are crucial to achieving better health – it is something I have to work for.
22. Often for me, feeling truly fit and well, and feeling truly happy are much the same thing.
23. There are times when I think I become ill because of deep-seated worries of which I am not consciously aware.
24. My health is my own responsibility.
25. Stress only makes me ill when I'm "down"; when I'm feeling full of energy and/or content, I can ride it out with no ill effects.
26. When I'm ill, my ability to recover will depend very little upon other events in my life (e.g. whether there are other stresses like trouble at work).
27. I think good health has more to do with living a satisfying and fulfilling life than being obsessive over things like exercise and diet.

REJECTING MEDICATION

1. When I'm ill enough to consult a doctor, my recovery will be faster if I comply properly with the advice and treatment I get.
2. I usually expect to take medicine to help me recover from illness.
3. I have very little faith that the advice I may get from the medical profession can help very much in improving my health.
4. If I were ever seriously ill, I would have a lot of faith in the ability of doctors to find a cure.
5. My state of health at any time is considerably influenced by whether or not I've been exposed to infectious or contagious disease organisms.
6. When I'm exposed to infection, my capacity to maintain health is seriously impaired.
7. I cannot improve my health by taking "tonics" or extra vitamins.
8. When I'm ill, sometimes just a chance to talk to the doctor will make me feel better.
9. When I'm ill, my recovery depends very little on the quality of medical treatment I receive.
10. I don't believe that my health is very much affected by chemicals such as additives in food, or pollution.
11. With minor illness, I think that I will do far better to let "nature take its course" than seek out medical treatment.
12. Where certain forms of illness are concerned, I would seek help from competent practitioners in "alternative medicine".

RELIANCE ON FAMILY

1. The state of my relationships with others show how well or badly I'm getting on with those close to me at a particular point in time and has a significant impact on my state of health.
2. When others are unpleasant to me, or I get into conflicts with them, it can have the effect of making me ill.
3. My recovery from illness depends a lot on the circumstances in which I'm ill- some would help my recovery, others would make it more difficult.
4. The care and support I receive from others has an influence on my overall health.
5. Sometimes the stupid and/or thoughtless actions of others can lead to me becoming unwell.
6. The "tender loving care" I get from others when I'm ill can make all the difference to whether I make a full recovery or not.
7. Major stresses in my childhood have shown up as illness in my adult life.
8. For me illness can sometimes be a way of withdrawing from life or my responsibilities.

Appendix D: Abbreviated Multidimensional Acculturation Scale

The following section contains questions about your *culture of origin* and your *native language.* By *culture of origin* we are referring to the culture of the country either you or your parents came from (e.g., Cuba, Jamaica, Haiti). By *native language* we refer to the language of that country, spoken by you or your parents in that country (e.g., Spanish, Patois, Creole). If you come from a multicultural family, please choose the culture you relate to the most.

Instructions: Please mark the number from the scale that best corresponds to your answer.

1	2	3	4
Strongly Disagree	Disagree Somewhat	Agree Somewhat	Strongly Agree

1. I think of myself as being U.S. American.
2. I feel good about being U.S. American.
3. Being U.S. American plays an important part in my life.
4. I feel that I am a part of U.S. American culture.
5. I have a strong sense of being U.S. American.
6. I am proud of being U.S. American
7. I think of myself as being (a member of my culture of origin).
8. I feel good about being (a member of my culture of origin).
9. Being (a member of my culture of origin) plays an important part in my life.
10. I feel that I am part of (culture of origin).
11. I have a strong sense of being (culture of origin).
12. I am proud of being (culture of origin).

Please answer the questions below using the following responses:

1	2	3	4
Not at all	A Little	Pretty Well	Extremely well

How well do you speak English?

1. at school or work
2. with American friends
3. on the phone
4. with strangers
5. in general

How well do you understand English?

6. on television or in movies
7. in newspapers and magazines
8. words in songs
9. in general

How well do you speak your native language?

10. with family
11. with friends from the same country as you
12. on the phone
13. with strangers
14. on the phone

How well do you understand your native language?

15. on television or in movies
16. in newspapers and magazines
17. words in songs
18. in general

How well do you know?

19. American national heroes
20. popular American television shows
21. popular American newspapers and magazines

22. popular American actors and actresses
23. American history
24. American political leaders

How well do you know?

25. national heroes from your native culture
26. popular television shows in your native language
27. popular newspapers and magazines in your native language
28. popular actors and actresses from your native culture
29. history of your native culture
30. political leaders from your native culture

Appendix E: Contact Attempts - Health Belief Model Questionnaire Permission

Undeliverable: Permission - Health Belief Model Scale

The original message was received at Mon, 16 Oct 2017 17:59:13 -0400 from SMTP02.fiu.edu [127.0.0.1]

----- The following addresses had permanent fatal errors ----- <Enid.kwong@polyu.edu.hk>
(reason: 550 #5.1.0 Address rejected.)

----- Transcript of session follows ----- ... while talking to esa3.polyu.c3s2.iphmx.com.:
>>> RCPT To:<Enid.kwong@polyu.edu.hk>
<<< 550 #5.1.0 Address rejected.
550 5.1.1 <Enid.kwong@polyu.edu.hk>... User unknown
>>> DATA
<<< 503 #5.5.1 RCPT first

Undeliverable: Permission to Use Health Belief Model Scale

The original message was received at Tue, 17 Oct 2017 11:53:13 -0400 from SMTP02.fiu.edu [127.0.0.1]

----- The following addresses had permanent fatal errors ----- <enid.kwong@polyu.edu.hk>
(reason: 550 #5.1.0 Address rejected.)

----- Transcript of session follows ----- ... while talking to esa3.polyu.c3s2.iphmx.com.:
>>> RCPT To:<enid.kwong@polyu.edu.hk>
<<< 550 #5.1.0 Address rejected.
550 5.1.1 <enid.kwong@polyu.edu.hk>... User unknown
>>> DATA
<<< 503 #5.5.1 RCPT first

Undeliverable: Permission to Use Health Belief Model Scale

The original message was received at Mon, 23 Oct 2017 14:56:55 -0400 from SMTP05.fiu.edu [127.0.0.1]

----- The following addresses had permanent fatal errors ----- <hsenid@inet.polyu.edu.hk>
(reason: 550 #5.1.0 Address rejected.) <enid.kwong@plyu.edu.hk>
(reason: 550 Host unknown)

----- Transcript of session follows ----- ... while talking to esa3.polyu.c3s2.iphmx.com.:
>>> RCPT To:<hsenid@inet.polyu.edu.hk>
<<< 550 #5.1.0 Address rejected.
550 5.1.1 <hsenid@inet.polyu.edu.hk>... User unknown
>>> DATA
<<< 503 #5.5.1 RCPT first
550 5.1.2 <enid.kwong@plyu.edu.hk>... Host unknown (Name server: plyu.edu.hk.: host not found)

Appendix F: Permission – Health Belief Questionnaire

PsycTESTS®

Health Beliefs Questionnaires
Version Attached: Full Test

Note: Test name created by PsycTESTS

PsycTESTS Citation:
Furnham, A. (1994). Health Beliefs Questionnaires [Database record]. Retrieved from PsycTESTS. doi: http://dx.doi.org/10.1037/t18863-000

Instrument Type:
Inventory/Questionnaire

Test Format:
All items on the 80-item Health Beliefs Questionnaires were rated on a 7-point scale ranging from Agree to Disagree.

Source:
Furnham, Adrian. (1994). Explaining health and illness: Lay beliefs on the nature of health. Personality and Individual Differences, Vol 17(4), 455-466. doi: 10.1016/0191-8869(94)90083-3, © 1994 by Elsevier. Reproduced by Permission of Elsevier.

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Appendix G: Permission – Abbreviated Multidimensional Acculturation Scale

Dear Dona,

Thank you for your interest in our scale. You have our permission to use it, so please keep this email as proof of permission.

I am attaching Spanish and English versions of the AMAS, as well as some instructions for coding. A former student, Alex Murguia, developed a Cultural Health Attributions Questionnaire (CHAQ) which you may want to check. I am attaching it below. The only problem is that it may be too much to tax your participants with too many measures.

I would love to know what you find in your study. Best of luck in your research.

Maria Cecilia Zea, Ph.D.
Professor
Department of Psychology
George Washington University
Washington DC 20052

Founding Director,
Latino Health Research Center
http://research.columbian.gwu.edu/lhrc/
http://lhrc.columbian.gwu.edu/maria-cecilia-zea-phd
Acting Director, Social and Behavioral Sciences Core
DC Center for AIDS Research (DC CFAR)
http://dccfar.gwu.edu/

On Mon, Oct 16, 2017 at 5:02 PM, Dona Walcott <dwalcott@fiu.edu> wrote:

Dear Dr. Maria Cecelia Zea,

I am a doctoral student attending Walden University and I am seeking permission to use your Abbreviated Multidimensional Acculturation Scale in my study entitled "*Cultural Beliefs and Influenza Vaccination among Caribbean-born Students at a University in the United States*". I will be studying the association of cultural health beliefs on students' perceptions about influenza vaccination and how it may impact their decisions to reject or accept the influenza vaccination

on a college campus. I am also studying the association of acculturation and cultural beliefs among these Caribbean-born students. Your acculturation scale best fits what I am investigating and I am required to get permission from the author(s) to use the scale, in order to submit my IRB application. Kindly let me know if you are the person to speak with. I would appreciate any assistance you can give me.

Sincerely,

Dona S. Walcott MPH, MCHES

Assistant Director

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