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Social Determinants of Health and Health Behaviors of Hispanics

Suheily Valderrama
Walden University

Walden University

College of Social and Behavioral Sciences

This is to certify that the doctoral dissertation by

Suheily M. Valderrama

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Review Committee
Dr. Silvia Bigatti, Committee Chairperson, Psychology Faculty
Dr. Jay Greiner, Committee Member, Psychology Faculty
Dr. Peggy Gallaher, University Reviewer, Psychology Faculty

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

Walden University
2020

Abstract

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by

Suheily M. Valderrama

MPhil, Walden University, 2019

BA, University of Texas at San Antonio, 2017

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Mexican Americans experience higher morbidity and mortality than non-Hispanic whites, a problem known as health disparities, which is often explained by differences in social determinants of health (SDH). SDH are social and economic conditions that influence health-related behaviors. The purpose of this quantitative study was to examine the relationship between SDH (income, education, neighborhood safety, and health care access), and health behaviors (diet, sleep, and physical activity) of Hispanics. The cumulative inequality (CI) theory was used to inform this study. A secondary data analysis of 37078 Hispanic adults who completed the 2017 Behavioral Risk Factor Surveillance System survey was conducted. Regression analysis (binomial logistic regression, and multiple linear regression) showed that SDH (income, education, neighborhood safety, and health care access) were statistically significant predictors of health behaviors among the sample. Specifically, income, education and neighborhood safety predicted diet, income and education predicted physical activity, and education predicted sleep. The overall findings point to the importance of considering the adverse impact SDH can have on Hispanics' health behaviors. This study can contribute to social change by helping Hispanics and their health care providers understand how specific SDH influence their health behaviors, which in turn can help practitioners develop new treatment approaches and policies that either reduce SDH or promote positive health behaviors in spite of their challenges.

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Dedication

I would like to dedicate this study to the Hispanic community that has inspired, supported, and motivated me to try to make a difference through their kindness, courage, and hard work. Together we can create a better tomorrow!

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This milestone would not have been possible without the support, encouragement, and guidance of my chair, Dr. Silvia Bigatti. I am beyond grateful to have had her knowledge and expertise to help guide me throughout this process. She was an incredible mentor and I'll forever cherish the wisdom she has passed on to me. A huge thank you to my committee member and methodology expert Dr. Jay Greiner for his support, advice, and contribution to my dissertation. I would also like to acknowledge my URR, Dr. Peggy Gallaher for her efforts and direction needed to complete this dissertation.

To my beautiful daughter, family, and loved ones I can't thank you enough for supporting me and pushing me to achieve my dreams, even when they were seemingly out of reach. You instilled hope and confidence in me during my weakest of times and reminded me how important it was to have faith and trust God.

Above all, I'm eternally grateful to my savior Jesus Christ, for this is in His glory. He has provided me with the strength, knowledge, opportunity, and ability to complete this dissertation. This achievement would not be possible without His blessings.

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Chapter 1: Introduction to the Study

Introduction

Health behaviors acquire a vital role in a person's ability to maintain a healthy lifestyle and optimal quality of life regardless of ethnic background (Adler et al., 2016). The issue of health disparities has been found to influence health behaviors among disadvantaged or specific populations, such as Hispanics (Short & Mollborn, 2015). While focus and efforts to reduce health disparities among ethnic minorities have been put in place over the last two decades, health disparities remain prevalent and well documented among individuals in the United States (Berge et al., 2018). This study focused on Mexican Americans, the largest group of Hispanics in the United States (U.S. Census Bureau [USCB], 2020).

Research involving health disparities incorporates the concept of ethical judgment due the perception of whether a disparity is arbitrary, avoidable, or biased (Braveman, 2006). Human rights and social justice are foundational aspects of health disparities (Braveman, 2006). Mexican Americans are amongst the individuals that experience health disparities, which in turn is influenced by social determinants of health (SDH) (Alcántara et al., 2017). In this study, SDH of health disparities of Hispanics were examined in the way in which they impact health behaviors. I reviewed the literature on Mexican Americans when able as that was my group of interest, but sometimes Mexican Americans were included the generalized 'Hispanic' ethnic group.

Background

Social Determinants of Health

SDH influence health outcomes and lead to health disparities among Mexican Americans (Adler et al., 2016). SDH refer to the different economic and social conditions amongst individuals or specific groups that affect health (Adler et al., 2016). There are substantial disparities in all SDH including educational attainment, poverty rates, and health care access among Mexican Americans (Cara et al., 2017; Velasco-Mondragon et al., 2016). Researchers have shown that these factors are underlying causes of mortality and morbidity experienced by Mexican Americans (Singh et al., 2017).

SDH could serve as a framework to predict and determine health behaviors (Maness & Branscum, 2017). Some areas of SDH can help identify and address potential health behavioral risks (Maness & Branscum, 2017). For instance, using SDH such as neighborhood and built environment to predict unhealthy physical activity, or finances to predict diet behaviors (Maness & Branscum, 2017). The level of predictability relies on the specific SDH and specific health behaviors used because not all SDH will be predictors of all health behaviors (Maness & Branscum, 2017).

Using various levels of measurement that incorporate SDH, health equity, and health disparities can demonstrate how social determinants affect health (Penman-Aguilar et al., 2016). Additionally, the multifactorial construct of health disparities, including social, economic, and cultural influences contribute to physician interpretation and intervention in health-related matters (Riley, 2012). Fox et al. (2015) reported that physicians lack the ability to influence social and behavioral change necessary to create

better outcomes for patients, which strengthens the influence SDH have on health disparities. Furthermore, objectives for the Healthy People 2020 were not being met by low-income, diverse, and immigrant families (Berge et al., 2018), like those from Mexican backgrounds.

Health Behaviors

Social determinants can be linked to the complex interplay between individuals and contextual factors that contribute to established health behaviors (Short & Mollborn, 2015). Adler et al. (2016) found that the focus on acute health problems has hindered the opportunity for overall health and longevity. The authors indicated that priorities need to be shifted to place focus on health-damaging social conditioning, preventative care, and better health behavioral decisions. Specifically, Alcántara et al. (2017) reported that the sociocultural stressors, like poor neighborhood conditions, and economic status, Mexican Americans face are associated with adverse sleep outcomes and Escarce et al. (2006) stated that negative health behaviors (diet and physical activity) influenced by cultural factors, have been found to produce unfavorable health outcomes among Mexican Americans.

Problem Statement

Health disparities refer to inequalities and differences in health and health care opportunities among distinctive populations or groups of people (Riley, 2012), typically poor and minority groups. These inequalities negatively impact individuals' quality of life and wellbeing and can result in unnecessary costs to individuals and health care providers (Vega et al., 2009). Moreover, health disparities cause individuals to

experience disproportionate risks to: access to care, insurance, health resources, educational resources, and health outcomes (Adler et al., 2016). Preventable and manageable health outcomes, such as chronic diseases, are increasing among population groups that experience health disparities (Berge et al., 2018).

Hispanics, as a group, experience significant health disparities. While Hispanics typically have lower rates of mortality, this population experiences higher morbidity rates compared to the rest of the United States population (Cara et al., 2017). Mexican Americans have a higher prevalence of mortality and morbidity factors in areas including diabetes, cancer, liver disease, cardiovascular disease, and work-related injuries (Cara et al., 2017; Hammig et al., 2019; Hoffman et al., 2020; Singh et al., 2017; Velasco-Mondragon et al., 2016). Current literature suggests that future research is needed to further evaluate these details among ethnic subpopulations, like Mexican Americans (Cara et al., 2017; Singh et al., 2017). There is a need for clarification on health disparities Mexican Americans experience through the understanding of their diverse SDH to make culturally appropriate assessments (Cara et al., 2017).

In this study, I studied the following SDH: income, education, neighborhood safety, and health care access. There is a lack of current SDH information specific to Mexican Americans (Adler et al., 2016; Cara et al., 2017; Velasco-Mondragon et al., 2016). However, the studies of SDH and Hispanics included this subpopulation. Hispanics hold a median household income that is 52% lower than the rest of the U.S population, and a high school dropout rate of 14% (Velasco-Mondragon et al., 2016), and health insurance coverage is much lower among Hispanics with 20.9% of the population

under 65 years of age being uninsured, and 33.6% of Hispanics considered poor are uninsured (Lucas & Benson, 2019). Mexican Americans demonstrate a lower likelihood to seek out and obtain health-care services (Cara et al., 2017). Because of their impact on health disparities, it is important to increase our understanding of these SDH.

One way these SDH influence health outcomes is through their influence on health behaviors (Betancourt et al., 2003). Health behaviors are actions individuals take that directly influence their health status and longevity (Short & Mollborn, 2015). Diet, sleep, and physical activity are the health behavior actions classified for this study. Previous research has identified a lack of physical activity and unhealthy diets as prominent health behaviors among Mexican Americans (Dellaserra et al., 2018; Lindsay et al., 2018). Furthermore, sociocultural stressors like poor living and economic conditions, have been found to cause negative sleep outcomes among Mexican Americans, which have caused adverse sleep-related health behaviors to develop and maintain (Alcántara et al., 2017).

Although there is current research on SDH and its association with negative health outcomes (Adler et al., 2016; Cara et al., 2017; Velasco-Mondragon et al., 2016; Singh et al., 2017), a gap in the literature exists in the relationship between SDH and health behaviors among Mexican Americans. The association between SDH and health behaviors is important to understand intervention methods for improving health behaviors and health care satisfaction.

Purpose of the Study

The purpose of this study was to examine the under-researched relationships between SDH and health behaviors among Mexican Americans. Health behaviors can be evaluated and described through an individuals' lifestyle and routine actions that may influence their health (Short & Mollborn, 2015). SDH are known to influence various aspects of health behaviors by determining the conditions in which individuals live (Short & Mollborn, 2015). I conducted a quantitative assessment of SDH and health behaviors among the Mexican American population using secondary data obtained from the 2017 Behavioral Risk Factor Surveillance System (BRFSS), which is a telephone survey administered to United States residents to collect data related to health-related risk behaviors and basic health information (e.g., demographics and health care access). This addressed the gap in the literature surrounding SDH and its relation to health behaviors among Mexican Americans.

Research Questions and Hypotheses

This research study answered the following question using data from the 2017 BRFSS. This data is available to use by researchers through the Centers for Disease Control and Prevention (CDC). This specific question was employed to examine the relationship between SDH and health behavioral outcomes of Mexican Americans:

1. **RQ1** – Quantitative: Are social determinants of health measured by the 2017 BRFSS (income, education, neighborhood safety, and health care access), statistically significant predictors of health behaviors measured by the 2017

BRFSS (diet, sleep, and physical activity) among the Mexican Americans in the sample?

Null Hypothesis #1. SDH (income, education, neighborhood safety, and health care access), will not predict diet among Mexican Americans as measured by the BRFSS.

Alternate Hypothesis #1. SDH (income, education, neighborhood safety, and health care access), will predict diet among Mexican Americans as measured by the BRFSS.

Null Hypothesis #2. SDH (income, education, neighborhood safety, and health care access), are not predictors of sleep among Mexican Americans as measured by the BRFSS.

Alternate Hypothesis #2. SDH (income, education, neighborhood safety, and health care access), will predict an individuals' sleep as measured by the BRFSS.

Null Hypothesis #3. SDH (income, education, neighborhood safety, and health care access), will not predict physical activity among Mexican Americans as measured by the BRFSS.

Alternate Hypothesis #3. SDH (income, education, neighborhood safety, and health care access), will predict an individuals' physical activity as measured by the BRFSS.

Theoretical Framework

The cumulative inequality (CI) theory provides a systematic explanation of the construct of inequality through social systems (Merton, 1988). The CI theory was initially

developed by Merton (1988) to express how specific individuals suffer from disadvantages that could affect different areas of their lives. The CI theory links various SDH-related concepts, including social, environmental, and health factors to the disadvantages certain individuals possess (Ferraro & Shippee, 2009). This theory's function is to provide an interpretation of how distinctive variables influence peoples' lives and exposure to risk (Merton, 1988). Furthermore, the CI model was established to support the CI theory by advancing the explanation of the complex interaction between individual, social, and environmental factors that attribute to health behaviors (Ferraro & Shippee, 2009). This theory was appropriate for my study because the CI theory reasoning, as related to health disparities, indicates that health behaviors can be established, and related to fundamental personal, and social variables including SDH (Ferraro & Shippee, 2009).

Nature of the Study

The nature of this study was a quantitative, correlational, survey design. Quantitative research was adequate for establishing relationships amongst variables (SDH, and health behaviors) among the Mexican American population. Conducting the study as a quantitative, correlational, survey design was adequate because the variables are not controlled. I examined the relationship between SDH and health behaviors through a statistical test designed to measure and interpret the degree of the relationship between the variables.

Penman-Aguilar et al. (2016) suggested that analyzing SDH, and health outcomes through questionnaires provide more equitable data on the subject. The participants are

Mexican American adults 18 years or older. Data from the Behavioral Risk Factor Surveillance System (BRFSS) was used to gain information regarding the Mexican American community. The BRFSS is a telephone survey made nationwide that collects data regarding health-related behaviors, health conditions, and demographic information (CDC, 2014). The secondary data was accessible via data sets on an official government website.

Definition of Key Terms

Hispanics are defined as group of individuals whose ethnicity is composed of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin regardless of their race (Office of Management and Budget [OMB], 1977).

Mexican Americans are individuals living in the United States that are of full or partial Mexican origin (Ortiz & Telles, 2012). They account for 61.5% of the Hispanic population in the United States (USCB, 2020).

Health disparities refers to preventable differences within components of health (e.g., disease, injury, and opportunity) that are experienced by disadvantaged populations (Office of Disease Prevention and Health Promotion [ODPHP], 2015). For the purpose of this study, the population is defined by as a group of individuals with a Hispanic ethnicity, of Mexican origin who live in the United States.

Social determinants of health (SDH) refer to the conditions (e.g., social and economic) in which a person exists (McGuire et al., 2006). The SDH that were evaluated in this study included income, education, neighborhood safety, and health care access.

Health behaviors refer to the behavioral actions' individuals express that could either positively or negatively affect their health (Short & Mollborn, 2015). The health behaviors used for this study included diet, sleep, and physical activity.

Assumptions

In this study, I assumed that the de-identified data collected from the BRFSS will be representative of the Mexican American population in the United States. CDC provided the option to conduct the survey in English or Spanish per the participants' preference (CDC, 2018). It was assumed that providing the Spanish version of the questionnaires increases the representativeness of the population to reflect the actual population. This assumption stemmed from ensuring the participants' understanding of the questions by surveying in the participant's preferred language. I assumed that giving the participants the option to use their native language would make them more comfortable answering the survey. In addition, I assumed that the anonymity of the questionnaire could reassure participants' views on privacy and result in authentic responses.

Scope and Delimitations

I evaluated the relationship between SDH and health behavior outcomes among Mexican Americans in the United States through quantitative survey research. I limited the scope based on the characteristics of the secondary data set I used, which included income, education, neighborhood safety, and health care access. Specifically, other alternative SDH conditions were not used in this study due to data quality and type of information available from the Center for Disease Control and Prevention's BRFSS

survey. The participants were limited to adult Mexican Americans residing in the United States who answered the survey in 2017.

Limitations

This study was based on secondary data. Therefore, I did not assess all SDH identified in the research literature, instead, I assessed a limited number. However, using secondary data was cost-effective and saved an abundance of time, given that the data was cleaned, formatted, and ready for analysis. A potential limitation of survey research studies was the representativeness of the sample, in this case of Mexican Americans. Since the BRFSS data was collected from Mexican Americans throughout the United States in English, with the option to respond to a Spanish version of the core questionnaire and optional modules that could be adapted to accommodate the needs of Spanish speakers (CDC, 2018), this was less of a concern and could be considered a methodological strength.

Significance

The results of this study provided much-needed insights into how the specific SDH I examined could relate to health behaviors among the Mexican American population. Findings clarified the relationship between SDH and health behaviors to help better understand how they related to disparities among Mexican Americans. SDH have been a fundamental factor in understanding the development of health behaviors, because aspects of social determinants have negatively impacted the ability for individuals to sustain healthy lifestyles and hindered longevity amongst a wide range of populations, including Mexican Americans (Adler et al., 2016; Escarce et al., 2006).

Gaining this insight helped inform health care policies for Mexican Americans. Medical practices can be modified to be more accommodating to the needs of this specific group of people. Additionally, understanding which health behaviors are most significantly related to these social determinants can provide health care professionals a foundation for what areas to focus on in their care.

Summary

The purpose of this quantitative correlational, survey design was to evaluate the relationship between SDH and health behaviors of Mexican Americans in the United States. Research within this population has illustrated the negative effects of SDH on health behaviors. However, lacking was the examination of this incidence among the Mexican American population. Hence an investigation to comprehend the relationship between SDH and health behaviors among Mexican Americans.

This study was based on the CI theory defined by Ferraro and Shippee (2009). This chapter provided a brief presentation on the study to include an explanation of the problem, nature of the study, significance, assumptions and limitations. Chapter 2 will further support this chapter by going in-depth on the CI theory, SDH and health behaviors among Mexican Americans.

Chapter 2: Literature Review

Introduction

Health disparities are the preventable and unfair inequalities or differences in health and health care opportunities experienced by different groups (Riley, 2012). Health disparities affect not only health but also quality of life and add unnecessary costs to individuals and health care providers (Vega et al., 2009). Health disparities are associated with differences in access to care, insurance, health resources, educational resources, and health outcomes (Adler et al., 2016). This study focused on Hispanics, specifically Mexican Americans, for whom there are many recognized health disparities (Adler et al., 2016; Vega et al., 2009). Mexican Americans account for 61.5% of the Hispanic population in the United Sates (USCB, 2020).

The problem of health disparities is often explained in the context of SDH. SDH pertain to economic and social conditions amongst individuals or specific groups that influence their health and potentially health behaviors (Adler et al., 2016). Research has demonstrated that adverse SDH augment health problems among Mexican Americans (Beltrán-Sánchez et al., 2016; Boen & Hummer, 2019). SDH that impact Mexican Americans health include income, neighborhood safety, and health care access (Treadwell et al., 2019). What was not clear is whether these SDH impacted health at least partially through their relation to problematic health behaviors (Short & Mollborn, 2015). I explored this in this study, with a focus on diet, sleep, and physical activity.

The purpose of this study was to determine whether SDH predict health behaviors among Mexican Americans in the U. S. I used data from the BRFSS which is a national health-related telephone survey conducted annually by the CDC.

Content and Organization of the Chapter

A comprehensive literature review of health disparities, SDH and health behaviors is provided in this chapter. First, I discussed the theoretical and conceptual framework of this study. Secondly, the evident problem regarding health disparities was discussed followed by a description of the population of interest, Mexican American adults. Lastly, the chapter explored literature on SDH and health behaviors.

Literature Search Strategy

Research databases searched for the literature review relevant to this study included PsycINFO, Education Source, SocINDEX, MEDLINE, and PsycARTICLES. Google Scholar, and the National Center of Biotechnology Information (NCBI) were also used as a source to find relevant literature. Boolean operators were applied to maximize the number of relevant articles and minimize irrelevant literature. Search results were filtered to solely peer-reviewed articles. The keywords and terms, that were combined and individually utilized included: *health disparities, Hispanics, Mexican American, adults, BRFSS, health, health behavior, diet, sleep, exercise, physical activity, social determinants of health, income, education, living conditions, neighborhood safety, environmental conditions, health care access, social determinants, social disadvantage, and economic disadvantage*. The literature review was confined to articles published

from 2015 to 2020, with the exception of articles pertaining to theoretical and conceptual information.

Theoretical and Conceptual Framework

The study was grounded on CI theory. The CI theory provides a systematic explanation on how inequalities develop based on available resources, opportunities, and social systems from macro- and micro sociological components. The CI theory introduces an association of various SDH-related concepts, including social, biological, environmental, and health factors to the disadvantages people experience (Ferraro & Shippee, 2009). This theory provides an interpretation of how distinctive variables can influence the lives and exposure to risk of certain groups and individuals in society.

Ferraro and Shippee (2009) used cumulative disadvantage to further explain the development of systemic inequality that occurs throughout a person's lifetime through demographic and developmental processes. Accumulation of risk, resources, perceived trajectories, and human agency play a role in creating personal trajectories that lead to inequality. The five axioms of the CI theory include:

- Axiom 1: Social systems generate inequality, which is manifested over the life course through demographic and developmental processes.
- Axiom 2: Disadvantage increases exposure to risk, but advantage increases exposure to opportunity.
- Axiom 3: Life course trajectories are shaped by the accumulation of risk, available resources, and human agency.
- Axiom 4: The perception of life trajectories influences subsequent trajectories.

- Axiom 5: Cumulative inequality may lead to premature mortality; therefore, nonrandom selection may give the appearance of decreasing inequality in later life. (Ferraro & Shippee, 2009, p. 337)

The Population of Interest: Mexican Americans

The term Hispanic refers to an ethnicity composed of individuals of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, irrespective of the person's race (OMB, 1977). The Office of Management and Budget (1997) makes a clear distinction between race and Hispanic origin or ethnicity, the two should be used autonomously. Generally speaking, Hispanics in America are those that speak the Spanish language natively or classify themselves as Hispanic due to their ancestry (OMB, 1977). Individuals who identify as Hispanic experience commonalities such as heritage, culture, language, and history (OMB, 1997).

Mexican Americans in the U. S.

In the United States, Hispanics are the largest minority with approximately 18.4% of the population being of Hispanic origin (USCB, 2020). It is expected that number will rise to 26% by the year 2050 (USCB, 2017). The American Community Survey from 2019 reported that the largest group of Hispanic origin was made up of 61.5% of Mexican descent, followed by 9.6% of Puerto Rican descent, and then 4% of Cuban descent (USCB, 2020). In this study I focused on Hispanics that identify as Mexican American.

Of those Hispanics in the United States, 50.7% were born in their state of residence, 12.1% were born in other states in the United States, 4.4% are natives born

outside the United States, and 32.8% were foreign born (USCB, 2020). This may explain English language proficiency of the population. Only 42% of Hispanics considered native speak English only. For natives who speak another language, 84% could speak English 'very well' and 16% speak English less than 'very well' (USCB, 2020). Those percentages change for Hispanics that are foreign born. Only 5.2% of Hispanics considered foreign born speak English only. For foreign born individuals who speak another language, 33.7% could speak English 'very well' and 66.3% speak English less than 'very well' (USCB, 2020). Language proficiency impacts employment and income opportunity for Mexican Americans. Additionally, language proficiency is associated with health behaviors (DuBard & Gizlice, 2008). Individuals who are primarily Spanish speaking receive less preventative care and express poor health behaviors regardless of socioeconomic factors and demographics (DuBard & Gizlice, 2008).

Major Mexican American Cultural Values Associated with Health

Cultural factors differ by country of origin (Arredondo et al., 2016). Mexican Americans may struggle with access to and satisfaction with health care due to cultural factors that may cause friction during their health care encounters (Gauri et al., 2017). Understanding cultural factors in the Mexican American population can help improve access and satisfaction with their health care encounters (Gauri et al., 2017; Komen, 2016). The Mexican American population is composed of a collectivist culture that values group activities, family, responsibility, relationships, and accountability (Choi et al., 2019; Komen, 2016).

The magnitude of cultural factors observed in a Mexican American community may differ heavily based on acculturation, or the adaption to a different, more dominant culture (Arandia et al., 2018). When Mexican Americans immigrate to a different country, they may find ways to adapt to that country's culture (Arandia et al., 2018). In this case, the American culture being the new dominant one. Acculturation can influence strong traditional cultural values (Arandia et al., 2018). However, most Mexican American communities maintain their strong traditional core values and cultural factors throughout generations.

Familismo

According to the USCB (2020), there are over 89% of Hispanics live in family households. The concept of family has significant importance in the Mexican American community (CDC, 2012; Nuñez et al., 2016). Lopez (2006) defines *familismo* as a cultural value among the Mexican American community that involves the loyalty and commitment to immediate and extended family and plays a key role in identity and support; family takes precedence over one's own needs. Because Mexican American communities value family, they hold a strong commitment, respect, and mutual obligation to family (Corona et al., 2017). The family structure is patriarchal, where males typically have the greatest power or authority in the family (Nuñez et al., 2016). Males are expected to protect, provide, and lead the family in almost all aspects (Nuñez et al., 2016). Women are expected to be in a submissive position, where they show respect for their husbands (Nuñez et al., 2016). However, women hold power in other

ways such as being the main caregivers as well as gaining and sharing wisdom about cultural values and beliefs (Nuñez et al., 2016).

When it comes to health, *familismo* leads to specific behaviors among Mexican Americans (Corona et al., 2017). The man is head of household and makes important decisions, including health decisions for the rest of the family members (Nuñez et al., 2016). Similarly, the women or family members who are under the authoritative male will take the male's input seriously. Males will generally make final medical decisions and the family tend to respect and trust those decisions (Nuñez et al., 2016).

Personalismo, respectful and trust-building interaction, is tied to *familismo* (Davis et al., 2019). When communicating with Mexican American patients, providers have to consider this value to form an effective health care encounters with the patient (Fischer et al., 2017). Patients need to feel as though their family values and beliefs are respected (Park et al., 2018). Building good communication through clear explanations and engaging the patient with a pleasant and considerate manner will serve as a good foundation to improving health care satisfaction (Park et al., 2018). Trust will grow from those interactions where the individual perceives the respect being met (Fischer et al., 2017). Mistrust will create a barrier between the patient and health care (Fischer et al., 2017).

Spirituality, and Fatalism

Common beliefs among Mexican Americans include both *spirituality*, or the belief in the supernatural or a higher power and *fatalism*, or the belief that fate is inevitable and one cannot control an outcome (Nabhan-Warren, 2016). *Spirituality* and

fatalism are values to consider when communicating health information to the Mexican American population. These factors are important in the culture regardless of religious denomination and plays a key role in health, and lifestyle (Nabhan-Warren, 2016).

Mexican Americans value their spirituality, which is typically connected to their religious beliefs and affiliation, as well as is connected to their way of life (de la Rosa et al., 2016). Generally, spirituality for Mexican Americans is oriented with an image of a God and is associated to various religious traditions and meanings by which these individuals live (Nabhan-Warren, 2016; Nance et al., 2018). These individual use the supernatural, and sacred meanings for personal growth and daily life decisions, to include health behaviors (Schwingel et al., 2015). Spirituality guides their overall life experiences and decision making.

Individuals rely on their spirituality for strength and guidance on how to manage health issues (Erazo, 2017). Mexican Americans carry-out rituals or practices that they believe will impact which spirits influence their life (de la Rosa et al., 2016). Often times, this thought process will get in the way of obtaining the proper guidance to deal with certain health issues (Schwingel et al., 2015). An individual may rely on their spirituality to improve a health problem instead of seeking medical advice for a potential health issue (Schwingel et al., 2015). For example, relying on remedies and folk tales for healing properties rather than seeking professional attention (Erazo, 2017). Spirituality is also connected with views on illnesses, death, and the afterlife.

Generally, traditional Mexican American beliefs encompass that illnesses are a result of *fatalism* (Komen, 2016; Ramírez & Carmona, 2018). Mexican Americans will

believe that life events our guided by external forces that are intangible (Komen, 2016; Ramírez & Carmona, 2018). In other words, their outcomes or fate cannot be altered through interventions and they cannot take control over their fate. Health care providers utilize this knowledge in ways of communicating information (Komen, 2016). Providers can open communication by bringing awareness and highlighting the importance of understanding risks and health behaviors (Komen, 2016). Health care workers can also give recommendations and motivate patients to take control of their actions and in turn their outcomes without interfering with a patient's deeply rooted religious beliefs (Komen, 2016).

Spirituality and *fatalism* can play a role in how Mexican Americans live their life and the health choices they make on a daily basis (Ramírez & Carmona, 2018). To note, income and education impacts the magnitude to which Mexican Americans believe and rely on their spirituality or religion (Jung et al., 2016). Individuals with higher income and education would be less likely to rely on spiritualism, and fatalism for health maintenance and health decision making (Jung et al., 2016). However, these two cultural factors can have an impact on the life of Mexican Americans due their overall importance in people's lives.

The Problem: Health Disparities Affecting Mexican Americans In the United States

Health disparities for Mexican Americans motivate this study and are the distal outcome that may be explained at least partially by differences in health behaviors among Mexican Americans, which is my outcome of interest. Healthy People 2020 defines a health disparity as a specific difference in health associated with social or economic

disadvantage (ODPHP, 2015). The U.S. Department of Health and Human Services (HHS) (2008) stated "health disparities adversely affect groups of people who have systematically experienced greater social or economic obstacles to health based on their racial or ethnic group, religion, socioeconomic status, gender, mental health, cognitive, sensory, or physical disability, sexual orientation, geographic location, or other characteristics historically linked to discrimination or exclusion" (p. 28).

Major health disparities for Mexican Americans include lack of health care access, diabetes mellitus, cancer, obesity, liver disease, cardiovascular disease, and work-related injuries (Hammig et al., 2019; Hoffman et al., 2020; Velasco-Mondragon et al., 2016). There are other prominent health problems in this population. However, these health problems were found to be of excess burden to the Mexican community in the United States (Hammig et al., 2019; Hoffman et al., 2020; Velasco-Mondragon et al., 2016).

Mexican Americans experience health disparities due to SDH (Hammig et al., 2019; Hoffman et al., 2020; Velasco-Mondragon et al., 2016). Researchers have found that SDH such as income, unstable employment, educational level, and living in caustic environments compromise people's health and affect their lifestyles (Velasco-Mondragon et al., 2016). These SDH are heightened for Mexican American women, who experience lower income and education then men (Velasco-Mondragon et al., 2016). In this next section I will discuss the SDH that I focused on in this study.

The Outcome: Health Behaviors of Mexican Americans

Health behaviors are the actions individuals carry out that influence their health and wellbeing (Petrovic et al., 2018; Short & Mollborn, 2015). Individuals carry out these behaviors with or without intention (Petrovic et al., 2018; Short & Mollborn, 2015). An individuals' health may deteriorate depending on how the health behavior is carried out (Petrovic et al., 2018; Short & Mollborn, 2015). Health behaviors are dynamic; these actions can be deliberately changed through interventions to promote positive outcomes (Petrovic et al., 2018).

Diet

Heritage plays a role in dietary habits (Mattei et al., 2019). Mattei et al. (2019), established that dietary quality differs between Hispanic groups. In other words, Mexican Americans adapt the core dietary characteristics of their home country. Additionally, family is an important part of a Mexican Americans' diet. Eating homemade meals together as a family, family rituals, and heritage are valued among Mexican American communities (Coe et al., 2018).

Generally speaking, traditional Mexican diets are more protective of the individual's health than an acculturated diet, which tends to be less protective. Mexican diets consist of carbohydrates, protein, and fiber, and a low intake of saturated fat (Morales et al., 2002). However, according to Mattei et al. (2016), unacculturated Mexican Americans also consume lower amounts of sugar-sweetened beverages, whole grains, and fruits. Mexican American males tend to consume more fruits, vegetables and starchy vegetables than females regardless of age (Tam et al., 2017).

Diets in a common Mexican American cuisine include grains, beans, proteins, fruits, and vegetables (Valerino-Perea et al., 2019). Grain options include bread, rice, tortillas, and flour (Valerino-Perea et al., 2019). Common types of beans include black, legume, pinto, and red beans (Valerino-Perea et al., 2019). For proteins, these individuals consume turkey, chicken, fish, beef, and nuts. Dairy consists mainly of milk and cheeses to go along with their dishes (Valerino-Perea et al., 2019). Additionally, there are some common ingredients used in many dishes to include avocados, corn, chile, herbs, cilantro, honey, sugar, salt, and tomatoes (Valerino-Perea et al., 2019). Mexican Americans also incorporate many fruity options into their diets as snacks or desserts (Valerino-Perea et al., 2019). These fruits are unique to their specific diet and include, citrus fruits, bananas, guava, mangos, papaya, prickly pear, anona and zapote (Valerino-Perea et al., 2019).

Acculturation changes the traditional Mexican American cuisine in various ways (Arandia et al., 2018). As Mexicans adapt to living in America, their diets and traditional cuisine being to change (Arandia et al., 2018). Notable changes are in the emphasis on lunch and dinner meals, increases in high-fat dairy products, less vegetables, and an increase in overall fats (Lindsay et al., 2018). Decreases in fruit intake and increases in high-sugar foods are observed in the acculturated diet (Arandia et al., 2018). One of the biggest changes is the decrease in daily rice and bean consumption and increase protein and saturated fats intake. There's a shift from the traditional habit of having family homemade meals and the family rituals involved in food preparation to getting takeout (Coe et al., 2018; Lindsay et al., 2018).

Although understanding the dietary characteristics of Mexican Americans, and how they may change as they adapt to the United States, it is important to highlight that an important determinant of diet is food insecurity, which may be common in this population.

Food availability is closely related to income and education, as well as affects a large number of Mexican American households (Potochnick et al., 2019; Rabbitt et al., 2016). Given that Mexican Americans tend to experience lower income and education than non-Hispanics, they also have more difficult obtaining necessary daily food intakes (Potochnick et al., 2019; Rabbitt et al., 2016). In fact, Mexican Americans are twice as likely to experience food insecurity (Potochnick et al., 2019; Rabbitt et al., 2016). Researchers have shown that this high food insecurity in the Mexican American population is due to disparities in employment and lower-resourced schools being located in Hispanic communities (Rabbitt et al., 2016). The Supplemental Nutrition Assistance Program (SNAP) has helped Mexican American families obtain necessary nutritional intake (Rabbitt et al., 2016). However, this only applies to those who are legal immigrants. Citizenship status could make an individual ineligible for SNAP assistance (Rabbitt et al., 2016).

Sleep

Sleep quality has a significant impact on health (Dudley et al., 2017). Adequate sleep maintenance can result in a decreased risk for health issues such as metabolic diseases (Dudley et al., 2017). Conversely, insufficient sleep patterns can deteriorate an individual's psychological and physical health and put an individual at risk for negative

health outcomes (Dudley et al., 2017). Predictors of sleep patterns include age, gender, income, education and lifestyle habits (Dudley et al., 2017; Patel et al., 2015). Distinct groups or populations can exhibit similar negative or positive sleeping patterns.

Sleep behaviors vary between Hispanic heritages of those living in the United States (Dudley et al., 2017). Sleep outcomes are significantly different between Mexican, South American, Central American, Dominican, Puerto Rican, and Cuban Hispanics (Dudley et al., 2017). Those of Mexican background tend to display better sleep behaviors than other Hispanic heritages, especially Puerto Ricans (Dudley et al., 2017). However, the variations are closely related to demographic locations and stressors (Dudley et al., 2017).

Mexican Americans in the United States experience sociocultural and psychosocial stressor that interrupt adequate sleep (Alcántara et al., 2017). These stressors consist of acculturation stress, like living and economic conditions, as well as ethnic discrimination (Alcántara et al., 2017). Short sleep duration and greater daytime sleepiness was significantly associated with ethnic discrimination and acculturation stressors (Alcántara et al., 2017). It is widely known that chronic stress influences sleep disturbances (Alcántara et al., 2017). Moreover, chronic stress is associated with insomnia in the Mexican American population (Alcántara et al., 2017).

Income and education play a role in sleep hygiene (Patel et al., 2015). Those who experience lower income and education also experience poorer sleep patterns (Patel et al., 2015). Mexican Americans with lower income are found to present with inadequate sleep (Patel et al., 2015). As previously mentioned, income is associated with neighborhood

safety (Lindsay et al., 2018). Individuals who suffer from poor economic conditions also experience lack of neighborhood safety (Lindsay et al., 2018). Mexican Americans in impoverished conditions have insufficient sleep maintenance (Patel et al., 2015). Living with neighborhood safety conditions cause an added amount of stress and hardship that hinders sleep quality (Alcántara et al., 2017; Dudley et al., 2017; Patel et al., 2015). Adverse neighborhood conditions do negatively impact Mexican Americans' sleep outcomes (Patel et al., 2015) Therefore, inadequate sleep due to difficult conditions impacts more Mexican Americans provided that they disproportionally sustain lower income and lack of neighborhood safety. However, further information is needed on these factors impacting sleep quality that is specific to the Mexican American population to determine what areas of sleep quality are most affected and what factors contribute to the findings.

Physical Activity

Physical activity, like diet and sleep, is closely associated with positive and negative health outcomes (Arredondo et al., 2016; Gauri et al., 2017). Consistent physical activity can improve an individual's psychological and physiological state (Arredondo et al., 2016; Gauri et al., 2017). Moderate exercise can serve as a protective factor against various negative health conditions (Arredondo et al., 2016). Exercise or physical activity does not have to be an intentional activity done within a fitness center. Physical activity can include leisure activities, a household activity that required putting the body into significant motion, and active transportation (e.g., riding a bike or walking to work) (Gauri et al., 2017).

Physical activity can differ based on ethnic background (Arredondo et al., 2016). Generally, Mexican Americans' lifestyles are more sedentary (Morales et al., 2002). Significantly less Mexican American adults are meeting recommended daily physical activity metrics than non-Hispanic whites, with Mexican American women displaying lower levels of physical activity than their male counterparts (Perez et al., 2019). In a study by Chrisman et al. (2015), less than half of Hispanic all men and a quarter of the women met physical activity recommendations. However, more Mexican Americans engage in moderate to vigorous physical activity, which is due to occupying jobs that require high-intensity physical activity (Arredondo et al., 2016).

Adequate physical activity is an important factor in health maintenance, disease prevention, and good mental health (Gauri et al., 2017). On the other hand, insufficient physical activity can hinder these factors, resulting in worse health outcomes (Gauri et al., 2017). Some commonly perceived barriers to adequate exercise among Mexican Americans population include environmental barriers, insufficient time to engage in physical activity, fatigue, and lack of self-discipline (Abraído-Lanza et al., 2017; Dellaserra et al., 2018). These barriers are typically caused by family obligations, having physically demanding occupations, or lack of access to exercise facilities (Abraído-Lanza et al., 2017; Dellaserra et al., 2018). The extent of how barriers interfere with physical activity in the Mexican American population needs further evaluation. Moreover, an evaluation of specific barriers to adequate physical activity in the Mexican American adult population.

The Predictors: Social Determinants of Health

It is important to acknowledge the impact that SDH have on health disparities of Mexican Americans (Treadwell et al., 2019). SDH are conditions experienced by individuals (e.g., income, education, neighborhood safety, and health care access) in various settings (e.g., homes, schools, and workplaces) that affect their health status (Treadwell et al., 2019). These are the conditions under which individuals live, often for the entirety of their lives (McGuire et al., 2006). They are shaped by the distribution of money, power, and other resources at local and national levels (ODPHP, 2015). Income, education, neighborhood safety, and health care access are the SDH present in the 2017 BRFSS that were examined in this study as predictors of health behaviors.

For Mexican Americans, there is a greater concern for morbidity rather than mortality (Velasco-Mondragon et al., 2016) because Hispanics tend to live longer than non-Hispanic whites (Boen & Hummer, 2019). Morbidity, or level of health and wellbeing, in this population is influenced by social determinants such as income, education, and environment, as well as health behaviors (Velasco-Mondragon et al., 2016), such as diet, sleep, and physical activity. All of these factors were assessed in this study. These factors cause morbidity disproportionate to non-Hispanic whites. Hence, just because Hispanics are living longer does not mean that the have a good quality of life (Boen & Hummer, 2019).

SDH are often the root causes of the prevalent and preventable health conditions experienced in the Mexican American population (Velasco-Mondragon et al., 2016). Inadequate access to healthcare, low income, lack of education, and neighborhood safety

are all contributing to their inability to intervene or prevent various health factors (Velasco-Mondragon et al., 2016). Different SDH may correlate with one another, making it more difficult for an individual to overcome their influence on various outcomes (Boen & Hummer, 2019). For example, poor education can lead to lower income, which leads to decreased health care access. Hence, the importance of identifying consequential SDH in the specific population. Researchers can better understand an individual's lifestyle and the development of individuals' health behaviors by identifying the most common SDH experienced by Mexican Americans. Below I describe each SDH in detail.

Income and Health Disparities

Income impacts various areas of people's lives such as where they live, accessible resources, and their health (Baker, 2014; Beltrán-Sánchez et al., 2016). Empirical evidence has shown that income has an impact on the health of individuals (Baker, 2014), and is highly correlated with SDH (Treadwell et al., 2019). The poverty rate for Hispanics has decreased over the years (Semega et al., 2019). However, a disparity between Hispanics and non-Hispanic poverty levels persists (Beltrán-Sánchez et al., 2016). In 2018, 18.3% of Hispanics were below poverty level compared to the 8.7% non-Hispanic whites (Semega et al., 2019). The 2018 per capita income for Hispanics in the United States was $20,590 (Semega et al., 2019). The median household income for Hispanics was significantly lower than non-Hispanic whites (Semega et al., 2019). In 2018, the median household income for Hispanics was $51,450, compared to $70,642 of non-Hispanic whites (Semega et al., 2019). According to the U.S. Department of Labor,

Bureau of Labor Statistics (BLS) (2020), the median weekly earnings for Hispanic males was $296, and for women it was $254 compared to non-Hispanic white males' weekly income of $411, and $334 for non-Hispanic white females. This evidence shows that there is a disparity in income levels between Hispanics and non-Hispanics, which can have an impact on aspects of an individual's life such as their health.

Overall, Mexican Americans earn substantially lower income than non-Hispanic whites regardless of age or gender (Manuel, 2018). Within the Mexican American community, females tend to have lower income than males (Park et al., 2017; Velasco-Mondragon et al., 2016). Additionally, there is a notable growth in the gap in median income among Mexican Americans between the age of 25 to 64 compared to non-Hispanic whites. Specifically, the median income gap is wider the older the groups compared are (Velasco-Mondragon et al., 2016).

Income often varies on occupation (Velasco-Mondragon et al., 2016). Occupations have been studied in correspondence to an individual's health risk (Velasco-Mondragon et al., 2016). Mexican Americans tend to disproportionately attain high-health risk positions, particularly males (Velasco-Mondragon et al., 2016), that are considered to be undesirable, and lower paying (Olsen et al., 2019). These include occupations in construction, maintenance, production, transportation, or service occupations (USCB, 2020). Females generally hold administrative, services, or sales related occupations (USCB, 2020).

The patterns in the occupations held by Mexican Americans are correlated with the disproportionate income levels found in this population (Velasco-Mondragon et al.,

2016). Income levels can play a significant factor in health behaviors for individuals (Venkataramani et al., 2016). However, this relationship needs to be further evaluated in the Mexican American population.

Income and Health Behaviors

Income can be associated with certain unhealthy behaviors among Mexican Americans (Johnson et al., 2019; Velasco-Mondragon et al. 2016). Researchers have shown the association between low-income and certain health risk behaviors (Jáuregui, Vargas-Meza, et al., 2020; Velasco-Mondragon et al. 2016). These health behaviors include sedentary lifestyles, certain diet behaviors, and poor sleep hygiene (Jáuregui, Vargas-Meza, et al., 2020; Velasco-Mondragon et al. 2016).

Research indicates a connection between physical activity and income among individuals (Jáuregui, Salvo, et al., 2020; Stasi et al., 2019). Individuals with lower income levels are typically less likely to engage in exercise (Stasi et al., 2019). However, less research has been done to evaluate this connection in the Mexican American population. Sedentary lifestyles can lead to various health problems (Stasi et al., 2019). Hence, the need to further evaluate this relationship in this specific population.

Diet or nutrition, like physical activity, is essential for maintaining a healthy lifestyle (Velasco-Mondragon et al. 2016). Little research has been done on the dietary habits of Mexican Americans. Potochnick et al. (2019) showed that diet behaviors are attributed to food security. Individuals with low income may have more difficulty obtaining proper nutrition due to their food insecurity and lack of resources (Potochnick

et al., 2019). Low income may not only affect the amount of food obtained, but also the quality of food (Potochnick et al., 2019; Rabbitt et al., 2016).

Cholesterol intake is also higher among lower income Mexican Americans (Mattei et al., 2016). Additionally, obesity and overweight issues are less of a concern for Mexican Americans (Arandia et al., 2018). A better understanding of the dietary habits associated with income levels in Mexican Americans is warranted and can help address the health-risk factors found in this population.

Furthermore, income can also attribute to sleep behaviors (Dudley et al., 2017; Patel et al., 2015). Individuals with lower income often have poor neighborhood safety because income determines where an individual can live (Dudley et al., 2017; Patel et al., 2015). Lack of neighborhood safety is associated with increased sleep disturbances (Patel et al., 2015). Poor sleep hygiene can put individuals at an increased risk for health conditions (Dudley et al., 2017). There is a lack of literature on how income influences sleep hygiene among Mexican American individuals. This relationship needs further examination so that intervention measures for potential health behavioral issues in this population can be adequately accessed.

Education and Health Disparities

Ethnic disparities have been found in educational achievement and attainment (Gándara & Mordechay, 2017). Education is a measure of socioeconomic status (Flink, 2018). The higher the educational level the higher the income (Flink, 2018). Individuals experience lower income levels due to low educational attainment (Flink, 2018). Mexican Americans encounter an array of unique issues in the educational system (Espinoza-

Herold & González-Carriedo, 2017), including perceived discrimination, neglect, language barriers, and acculturation that impact their educational achievement and attainment at all levels (Espinoza-Herold & González-Carriedo, 2017; Flink, 2018).

The percentage of Hispanic young adults between the ages of 18 to 24 in college has increased over the last two decades (de Brey et al., 2019). In 2017, 36% of Hispanic young adults were enrolled in an undergraduate or graduate program (de Brey et al., 2019). However, these enrollment percentages are still significantly lower than non-Hispanic whites, non-Hispanic blacks, and Asians (de Brey et al., 2019). In 2016, 35% of young adults that were of Mexican American background enrolled in a college program (de Brey et al., 2019). Of that 35%, 71% of those students were from the immediate college enrollment rate, or students enrolling in college after high school graduation, very similar to non-Hispanic whites (de Brey et al., 2019). Among Mexican Americans, women have lower education compared men (Park et al., 2017; Velasco-Mondragon et al., 2016).

Level of education is associated with health (Vilsaint, 2019). According to Vilsaint et al. (2019), lower levels of education are associated with increased risk of negative health outcomes (e.g., psychological health, and physiological health). One factor that may explain this association is through health literacy (Jacobson et al., 2016). Mexican Americans disproportionately experience lower levels of health literacy (Housten et al., 2019), which adversely affects health. This indicates that lack of education and health literacy plays an important role in the development of negative health behaviors.

Language proficiency has a significant impact on educational attainment and health literacy (Flink, 2018). Limited English proficiency hinders educational attainment for Mexican Americans (Flink, 2018). English proficiency can determine the level of education an individual may achieve (Flink, 2018), and serves as a predictor of health literacy (Jacobson et al., 2016). However, researchers suggest that health literacy should be evaluated in the language a person is most proficient in (Housten et al., 2019). Individuals may experience limitations in their educational level and health literacy without adequate English proficiency (Flink, 2018; Jacobson et al., 2016). Furthermore, younger individuals will speak both Spanish and English while elders will utilize Spanish more often, if not always (Gil, 2018). Given that more of the younger Mexican American population are speaking both languages proficiently, they are also receiving higher education.

Education and Health Behaviors

An individual's educational level can impact a variety of factors, including health behaviors (Dudley et al., 2017; Potochnick et al., 2019; Rabbitt et al., 2016). Education can help predict certain health-risk behaviors, although little research exists on this relationship in regard to the Mexican American population (Dudley et al., 2017). Existing research on how education can inform health professionals on health-risk behaviors generally pertains to non-Hispanics. Nevertheless, better-educated individuals understand and have access to more information and resources that can aid health behaviors (Brunello et al., 2016). Less-educated individuals tend to rely on different sources for

information, which may result in poorer decision making and health behaviors (e.g., nutrition) (Brunello et al., 2016; Dudley et al., 2017).

Language proficiency can compromise educational attainment and an individual's ability to develop good health behaviors (Flink, 2018; Gil, 2018; Jacobson et al., 2016). Low English proficiency can create a language barrier that hinders the ability of Mexican Americans to obtain adequate information from their medical providers and other health professionals (DuBard & Gizlice, 2008; Gil, 2018). This also causes them to have to rely on other sources for information (DuBard & Gizlice, 2008; Gil, 2018). Patient-provider communication is vital in the health outcomes that include health behaviors (DuBard & Gizlice, 2008; Gil, 2018). Mexican Americans may receive information that they may not fully understand or misinterpret (DuBard & Gizlice, 2008; Gil, 2018). Individuals must have the education and capability to understand the information that is being presented to them to develop good health behaviors or intervene in inappropriate health behaviors.

A person's education can influence the health behaviors they maintain (Dudley et al., 2017; Potochnick et al., 2019; Rabbitt et al., 2016). More research is needed to evaluate the relationship between education and health behaviors among Mexican Americans. This information can help instruct a better line of communication to promote and develop adequate health behavioral interventions.

Neighborhood Safety and Health Disparities

Neighborhood safety is significantly associated with income and education (Lindsay et al., 2018). Hence, why poor neighborhood safety has been found in poverty level or low-income Mexican Americans, while better neighborhood safety conditions are

observed in individuals with higher income and education (Lindsay et al., 2018). Therefore, a larger portion of individuals living with poor neighborhood safety are from the Mexican Americans population.

Mexican Americans' neighborhood safety can influence their health outcomes. According to Perez et al. (2019), individuals have reported unfavorable neighborhood environments, regardless of their nativity. The researchers studied the perceptions, attitudes, and preferences of Mexican Americans on their neighborhood (Perez et al., 2019). Individuals born in the United States reported poorer neighborhood living attributes (Perez et al., 2019). Similarly, Chambers et al. (2016) evaluated housing and neighborhood environments among low-income Mexican American adults, which included neighborhood security. Neighborhood safety concerns were perceived among low-income Mexican Americans (Chambers et al., 2016).

Health outcomes associated with neighborhood safety are closely related to types of communities (Kaplan et al., 2019; Perez et al., 2019). Individuals living in impoverished communities tend to suffer from worse health outcomes and display negative health behaviors (Kaplan et al., 2019; Perez et al., 2019), especially those whom lack neighborhood security (Organista et al., 2017). On the contrary, having access to a safe environment can result in less difficult conditions and favorable outcomes. There is limited information the health behaviors of Mexican Americans in these impoverished communities.

Neighborhood Safety and Health Behaviors

Adverse neighborhood safety conditions have been found to be associated with negative health behaviors (Chambers et al., 2016; Perez et al., 2019; Silfee et al., 2016). Neighborhood safety can hinder the adherence to healthy lifestyle behaviors (e.g., physical activity, diet, and sleep) (Murillo et al., 2019; Perez et al., 2019; Silfee et al., 2016; Velasco-Mondragon et al., 2016). Additionally, there is some literature that discusses incorporating living factors (e.g., safety) into health interventions in the Mexican American community (Organista et al., 2017; Perez et al., 2019). Neighborhood safety has been found to affect health behaviors such as sleep patterns and physical activity (Kaplan et al., 2019; Perez et al., 2019; Silfee et al., 2016). According to Silfee et al. (2016) living in safer neighborhoods is associated with Mexican Americans engaging in physical activity. Conflicts with neighborhood safety have made it difficult for low-income Mexican adults to promote healthy physical activity and diet behaviors within their homes (Lindsay et al., 2018).

Limited information currently exists on the association of neighborhood safety to health behaviors (diet, sleep, and physical activity) in the Mexican American population within the United States. The majority of the literature uses environment or living conditions to describe other underlining health-risk factors or health disparities.

Health Care Access and Health Disparities

Health care access refers to the capability of an individual or groups of people obtaining adequate and prompt health care (Alcalá et al., 2017). Many Mexican Americans lack health care access due to financial barriers and other unique limitations such as lack of health insurance, organizational barriers to care, cultural, and language

barriers (Alcalá et al., 2017; Salinas et al., 2017; Hammig et al., 2019). According to the USCB (2020), 1.8 million Hispanics under the age of 19, 9.1 million between the age of 19 to 64 years, and 157,092 that are 65 years or over have no health insurance coverage.

The 2018 National Health Interview Survey reported that 46.4% of Hispanics under the age of 65 have private health insurance compared to 69.6% of non-Hispanics (Lucas & Benson, 2019). Similarly, 29.5% of Hispanics have Medicaid compared to 17.4% non-Hispanics, and 20.9% of Hispanics are uninsured compared to 8.7% of Hispanics (Lucas & Benson, 2019). Hispanics 65 years of age or younger who are considered 'poor', 11.4% have private insurance, 51.5% have Medicaid, and 33.6% are uninsured (Lucas & Benson, 2019). In comparison, non-Hispanic whites under the age of 65 who are considered 'poor', 25.8% have private insurance, 53.9% have Medicaid, and 15.1% are uninsured (Lucas & Benson, 2019). Hispanics considered 'near poor', 27.3% have private insurance, 41.5% have Medicaid, and 27.6% are uninsured in comparison to 'near poor' non-Hispanic whites 40.6% have private insurance, 36.7% have Medicaid, and 15.4% are uninsured (Lucas & Benson, 2019). For Hispanics considered 'not poor', 71.7% have private insurance, 12% have Medicaid, and 13.3% are uninsured, compared to non-Hispanic whites in which 84.7% have private insurance, 5.9% have Medicaid, and 5.8% are uninsured (Lucas & Benson, 2019).

The significant difference in health care described above shows the vast disparity faced within Mexican American communities when it comes to health care access (Manuel et al., 2018; Sohn, 2017). According to Clark et al. (2016), income differences are associated with types of health care plan an individual obtains. Medicaid is a federally

and state program designed to assist individuals with limited income and resources (Valle & Perez-Lopez, 2020). Mexican Americans under Medicaid had to qualify for the program by having low income and limited resources. More Mexican Americans are qualifying for Medicaid services than non-Hispanic whites (Lucas & Benson, 2019). Additionally, a significant higher number of Mexican Americans do not have any form of health insurance compared to non-Hispanic whites. This highlights the gaps in the need for financial, educational, and resource assistance in the Mexican American community. Clark et al. (2016) state that SDH still have to be overcome for health insurance coverage to improve, as well as barriers to health care access among the Mexican American population. Efforts are still needed in bridging the gap existing within SDH, health care access for Mexican Americans (Clark et al., 2016).

Mexican Americans, regardless of gender, are still experiencing significant health care access gaps despite the improvements after the implementation of the Affordable Health Care Act (Chen et al., 2016; Manuel et al., 2018; Velasco-Mondragon et al., 2016). This gap is even higher for those who are 65 years or older (Velasco-Mondragon et al., 2016). Health care access for uninsured individuals would restrict health resources and aid that an individual receives (Langellier et al., 2016).

Furthermore, a study conducted by Findling et al. (2019), 17% of Hispanics avoid seeking health services due to anticipated discrimination. This perceived discrimination is hindering individuals from receiving proper health care, which in turn leads to poor health outcomes regardless of income and educational level (Findling et al., 2019). Likewise, fear of retribution due to new policies, laws, or procedures has created a sense

of mistrust and apprehension for Mexican Americans to seek help (Vargas et al., 2017). For instance, the fear of being misclassified as an illegal immigrant and being subjected to unlawful arrest or punishments. This creates an issue in health care access and satisfaction (LeBrón & Viruell-Fuentes, 2020; Vargas et al., 2017). Mexican American communities living in this new onset of fear and anxiety are experiencing psychological and physiological effects (LeBrón & Viruell-Fuentes, 2020; Torres et al., 2018). This fear causes Mexican Americans to abstain from seeking and receiving health care and expands the necessity of health care access (Findling et al., 2019).

Health Care Access and Health Behaviors

Health care access can have an impact on health behaviors (Hood et al., 2016). Without sufficient access to the health care system, individuals may avoid seeking assistance for health issues (Hood et al., 2016). Subsequently, these individuals will lack the appropriate knowledge to change their health behaviors to improve their health (Velasco-Mondragon et al., 2016). Moreover, individuals with low health care utilization have been found to display poorer health behaviors (e.g., poor nutrition and inadequate physical activity) (Stang & Bonilla, 2018). The literature lacks current information on the link between health care access and Mexican American's health behaviors, specifically diet, sleep, and physical activity.

Summary and Conclusions

In this literature review I discussed health disparities and SDH as predictors of health behaviors. Disproportionate levels of income, lower levels of education, and low access to healthcare were found in the Mexican American population. Researchers have

shown that income, education, and neighborhood safety influence an individual's diet, sleep, and physical activity, which can then lead to adverse health outcomes (Abraído-Lanza et al., 2017; Dudley et al., 2017; Gauri et al., 2017; Potochnick et al., 2019). Mexican Americans exhibit poorer sleep, diet, and physical activity behaviors than non-Hispanic whites (Abraído-Lanza et al., 2017; Dellaserra et al., 2018; Patel et al., 2015; Potochnick et al., 2019). Extant literature has yet to evaluate the relationships of these health behaviors to SDH and evaluated SDH as predictors of health behaviors in the Mexican American population.

A review of the current literature revealed the need for further research to quantify the relationship of SDH to health behaviors in Mexican Americans. In Chapter 3, I will discuss the research design and rationale, methodology, and data analysis plan that I used to quantify the relationship between SDH and health behaviors in Mexican Americans.

Chapter 3: Research Method

Introduction

I aimed to evaluate the under-researched relationship between SDH and health behaviors among Mexican Americans in the United States. The literature reviewed in Chapter 2 showed SDH could have a negative impact on an individual's health and that negative health behaviors are associated with adverse health outcomes (Velasco-Mondragon et al., 2016; Treadwell et al., 2019). However, researchers have not studied the relationship between SDH and health behaviors in the Mexican American population. This gap in literature needed to be addressed because understanding this relationship could help impact social change by improving Mexican American patients' health knowledge, health care access and satisfaction, developing community-focused health initiatives, and help this population overcome challenges to optimal health.

This chapter includes details on the research questions, hypotheses, target population, variables, and measurements. My quantitative, correlational, survey research design and rationale were explained. Furthermore, I discussed threats to validity and ethical procedures.

Research Design and Rationale

In this study, I evaluated the relationship between SDH (predictor variables) and health behaviors (outcome variables) among Mexican Americans in the United States through a quantitative, correlational, survey research design using data from the Behavioral Risk Factor Surveillance System (BRFSS) collected in 2017. A quantitative research design allows researchers to study the relationship between predictor and

outcome variables (Bernerth et al., 2018). The quantitative data can be utilized to predict how SDH predict Mexican Americans' health behaviors to better understand how their health behaviors come to exist and how they can be improved. Regression analysis was used to determine how health behaviors are predicted based on SDH, as well as provided information on the strength of the relationship between the variables. The specific tests that were used include binomial logistic regression and multiple linear regression.

Methodology

Population

The target population for this study was Mexican American females and males 18 years of age or older. The respondents were United States residents, residing in any of the 50 states and three U.S. territories. Mexican Americans not residing in the United States or under the age of 18 were not be included in the study.

Sampling and Sampling Procedures

The sample was drawn from the 2017 BRFSS provided by the CDC. The BRFSS collects data for more than 400,000 adults annually (CDC, 2014) through telephone interviewing using stratified random sampling within the United States and simple random sampling in Guam and Puerto Rico.

I used the G*Power 3.1.9.6 software to determine the adequate sample size for this study (Faul et al., 2007; Faul et al., 2009). Bonferroni adjustments for multiple outcome variables (diet, sleep, and physical activity) brought the *p*-value to: 0.017. A power calculation was conducted for regression, using a power level of .95, 0.15 effect size, four predictors and *p*-value of .017. This suggested a needed sample size of 157

participants. All 2017 BRFSS respondents that fit eligibility criteria and have no missing data were included in the analysis.

Recruitment, Participation, and Data Collection

Recruitment and Participation

In collaboration with the state health departments, the CDC utilizes Random Digit Dialing (RDD) techniques on both landlines and mobile phones to collect data for the BRFSS survey (CDC, 2018). This includes the core component, optional BRFSS modules, and state added questions. All of the respondents must be adults 18 years or older to participate. The target population for cellular telephone samples for 2017 consisted of adults living in private residences or college housing. For landline dialing, the respondent is an adult within the household.

Data Collection

I used secondary data from the Behavioral Risk Factor Surveillance System (BRFSS). In 2017, a Computer Assisted Telephone Interview (CATI) system was used to collect the data (CDC, 2018). Ci3 WinCATI software consultants, who provide the tools to collect the data, were contracted to assist state health personnel in conducting interviews evaluated for interviewer performance. Interviews were conducted seven days per week during daytime and evening hours.

The 2017 dataset was accessed through the Centers for Disease Control and Prevention website. The data was available for public use. De-identified data that includes basic demographic information (e.g., age, ethnicity, gender, socioeconomic status, and educational status) could be immediately downloaded from the CDC

website. The 2017 dataset included all of the predictor and outcome variables of interest for this study.

Instrumentation

Behavioral Risk Factor Surveillance System (BRFSS)

The BRFSS is a system of ongoing health-related telephone surveys designed to collect health data annually. It is administered and supported by CDC's Population Health Surveillance Branch, under the Division of Population Health at the National Center for Chronic Disease Prevention and Health Promotion. The survey was established in 1984 by a committee of statistical and methodological experts to record annual health-related information (CDC, 2014). The survey is currently collected on a national level incorporating data from all 50 states and three U.S territories; it is the largest health survey in the world (CDC, 2018). This survey is continuously undergoing comprehensive evaluations to determine accuracy and ensure quality, validity, and reliability (CDC, 2017). The survey administered in 2017 included items related to the study variables, including health-related risk behaviors, health care access, demographic information, and other psychosocial constructs (CDC, 2017).

The primary concerns with using secondary data were the quality of the dataset and the applicability to one's aims and research questions (Cheng & Phillips, 2014; Tripathy, 2013). Neither of those concerns applied to this study. On the other hand, there were numerous benefits to utilizing secondary data. Secondary data provided access to a much larger dataset than I would otherwise be able to collect. Additionally, secondary

data was time and cost-efficient. The BRFSS is publicly available, which means it did not require monetary cost, permissions, or a user agreement.

Operationalization of Variables

See Table 1 for the actual items from the 2017 BRFSS survey to were used in this study. The reliability and validity of the BRFSS are adequate or exceptional (Adams et al., 2015; Li et al., 2012; Hu et al., 2011; Pierannunzi et al., 2013). There are no significant differences in the confidence of the BRFSS and other national health-related surveys (Fahimi et al., 2008; Pierannunzi et al., 2013). Numerous studies have used the BRFSS for psychosocial and health-related research (Adakai et al., 2018; Cheng & Phillips, 2014; Johnston, 2017; Singh et al., 2017). The BRFSS reports do not include information on the reliability and validity of the individual subsections or measures that will be utilized in this study. I report on internal consistency reliability from the study's sample in Chapter 4. Furthermore, the survey administered in 2017 includes sufficient measures of SDH and health behaviors to test hypothesized relationships.

Social Determinants of Health

Income. Income was measured by the respondents' household income level and their residual income.

Education. Education was measured by highest level of school completed.

Neighborhood Safety. Neighborhood safety was measured based upon perceived neighborhood safety.

Health Care Access. Health care access was measured by whether the respondent has health care coverage, their access to a primary care provider (PCP), and whether they have had issues obtaining health services due to financial reasons.

Health Behaviors

Diet. Diet was measured by the daily consumption of fruit and vegetables.

Sleep. Sleep was measured by sleep duration in number of hours.

Physical Activity. Physical activity was measured by whether the respondent has engaged in exercise or bodily activity outside of work within the last month.

Table 1

Predictor and Outcome Variables

Variable Name	Variable Type	Question from the 2017 BRFSS	Potential Response
Income	Ordinal	Your annual household income from all sources?	Less than $15,000 = 1 $15,000 to less than $25,000= 2 $25,000 to less than $35,000= 3 $35,000 to less than $50,000= 4 $50,000 or more=5
Income	Ordinal	In general, how do your finances usually work out at the end of the month?	End up with some money left over=1 Have just enough money to make ends meet=2 Not have enough money to make ends meet=3

Variable Name	Variable Type	Question from the 2017 BRFSS	Potential Response
Education	Ordinal	What is the highest grade or year of school you completed?	Did not graduate High School =1 Graduated High School =2 Attended College or Technical School=3 Graduated from College or Technical School=4
Neighborhood Safety	Ordinal	How safe from crime do you consider your neighborhood to be?	Extremely safe=1 Safe=2 Unsafe=3 Extremely unsafe=4
Health Care Access	Categorical	Do you have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, government plans such as Medicare, or Indian Health Service?	Yes=1 No=0
Health Care Access	Categorical	Do you have one person you think of as your personal doctor or health care provider? If “No” ask: “Is there more than one, or is there no person who you think of as your personal doctor or health care provider?”	Yes, only one=1 No=0
Health Care Access	Categorical	Was there a time in the past 12 months when you needed to see a doctor but could not because of cost?	Yes=1 No=0

Variable Name	Variable Type	Question from the 2017 BRFSS	Potential Response
Diet	Categorical	Consume fruit one or more times per day?	Yes, consumed fruit one or more times per day=1 No=0
Diet	Categorical	Consume vegetables one or more times per day?	Yes, consumed vegetables one or more times per day=1 No=0
Sleep	Ratio	On average, how many hours of sleep do you get in a 24-hour period?	__ __ Number of hours [e.g., 01-24]
Physical Activity	Categorical	During the past month, other than your regular job, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise?	Yes=1 No=0

Data Analysis Plan

The IBM Statistical Package for the Social Sciences (SPSS) Statistics, version 25, was utilized to conduct the data analysis. The CDC completes the data cleaning, weighting, and screening procedures. Given the differences in study variables between male and female Mexican Americans and by age, as reported in Chapter 2, I determined whether age or gender were correlated with the variables in the study and determined that controlling for age and gender did not have a significant impact on the outcome of the statistical analysis. Additionally, the dataset was narrowed down to include only Mexican

Americans' data and relevant variables within my research question (i.e., income, education, neighborhood conditions, and health care access, diet, sleep, and physical activity).

The hypothesis and statistical procedures are shown in Table 2 below.

Table 2

Research Question, Hypothesis, and Statistical Procedures

Research Question	Hypothesis (H_a)	Variables	Statistical Procedures
Quantitative: Are social determinants of health measured by the 2017 BRFSS (income, education, neighborhood safety, and health care access), statistically significant predictors of health behaviors measured by the 2017 BRFSS (diet, sleep, and physical activity) among the Mexican Americans in the sample?	$H1_a$: SDH (income, education, neighborhood safety, and health care access), will predict diet among Mexican Americans as measured by the BRFSS.	Independent: income, education, neighborhood safety, and health care access. Dependent: diet	Binomial Logistic Regression
	$H2_a$: SDH (income, education, neighborhood safety, and health care access), will predict sleep as measured by the BRFSS.	Independent: income, education, neighborhood safety, and health care access. Dependent: sleep	Multiple Linear Regression
	$H3_a$: SDH (income, education, neighborhood safety, and health care access), will predict physical activity as measured by the BRFSS.	Independent: income, education, neighborhood safety, and health care access. Dependent: physical activity	Binomial Logistic Regression

Threats to Validity

Potential threats to validity exist even when using national survey datasets (Boo & Froelicher, 2013; Tripathy, 2013). The most prevalent threats to validity arise from the data collection methods (Boo & Froelicher, 2013). The quality of the research results depends heavily on the quality of the data collected. Researchers must be mindful that the existing data was originally meant to answer different research questions (Boo & Froelicher, 2013; Tripathy, 2013). Therefore, this study's variables of interest may not have been assessed with acceptable measures or may have been defined differently than preferred. I did a comprehensive review of the CDC 2017 BRFSS codebook report, 2017 BRFSS questionnaire, summary reports, BRFSS data user guide, and papers on BRFSS data quality, validity, and reliability to address this concern before selecting the BRFSS. This ensured that the data would be an efficient fit for my research questions and confirmed that the variables of interest were appropriate for my desired analysis (Boo & Froelicher, 2013). I minimized errors and increased validity for my study by ensuring that the BRFSS dataset was compatible with my research question and that it was properly operationalized.

Another threat to validity is potential missing data (Boo & Froelicher, 2013; Pedersen et al., 2017). Missing data inflates type 2 error rates and affects the generalizability of the research results (Pedersen et al., 2017). To address this threat, researchers can delete the participant responses that had the missing values. Patterns were evaluated to determine potential biases and incorporated analytical strategies that addressed the missing data. The survey is generally administered in English with a

Spanish version of the core questionnaires and optional modules available as needed for Spanish speakers. Moreover, the CDC has methods in place to provide the public with complete clean data.

Ethical Procedures

Approval was obtained from the Walden University Institutional Review Board (IRB) before downloading the publicly available BRFSS from the CDC. The IRB approval number for this study was 09-04-20-0747312. Personal identifiable information was not collected to ensure privacy and confidentiality. The BRFSS dataset was downloaded and stored onto a password protected laptop. The CDC does not require any user agreements to obtain the dataset, and it is readily available on their website. A paper version of the data was not collected. The BRFSS dataset will be maintained for five years, and it will be destroyed from my laptop thereafter.

Summary

In summary, the purpose of this study was to evaluate the relationship between SDH and health behavior outcomes among Mexican Americans in the United States through quantitative survey research. The data collection occurred at one point in time through the internet data collection survey. Regression analysis was used to determine how health behaviors are predicted based on SDH and provide information on the strength of the relationship between the variables. In Chapter 4, I discuss the results of the data collected from the BRFSS.

Chapter 4: Results

Introduction

The proposed quantitative study aimed to examine the under-researched relationships between SDH (income, education, neighborhood safety, and health care access), and health behaviors (diet, sleep, and physical activity) of Mexican Americans. This chapter reiterates the research question and hypotheses. It also covers data collection, sample characteristics, data analysis results, and a summary of the overall findings.

Research Question and Hypotheses

The following research question and hypotheses guided this study. The research question asked: are social determinants of health measured by the 2017 BRFSS (income, education, neighborhood safety, and health care access), statistically significant predictors of health behaviors measured by the 2017 BRFSS (diet, sleep, and physical activity) among the Mexican Americans in the sample? The hypotheses were as follows:

- **Null Hypothesis #1.** SDH (income, education, neighborhood safety, and health care access), will not predict diet among Mexican Americans as measured by the BRFSS.
- **Alternate Hypothesis #1**. SDH (income, education, neighborhood safety, and health care access), will predict diet among Mexican Americans as measured by the BRFSS.
- **Null Hypothesis #2**. SDH (income, education, neighborhood safety, and health care access), are not predictors of sleep among Mexican Americans as measured by the BRFSS.

- **Alternate Hypothesis #2**. SDH (income, education, neighborhood safety, and health care access), will predict of an individuals' sleep as measured by the BRFSS.
- **Null Hypothesis #3**. SDH (income, education, neighborhood safety, and health care access), will not predict physical activity among Mexican Americans as measured by the BRFSS.
- **Alternate Hypothesis #3**. SDH (income, education, neighborhood safety, and health care access), will predict an individuals' physical activity as measured by the BRFSS.

Data Collection

The 2017 BRFSS was retrieved from the CDC for this research. Mexican Americans could not be separated from the rest in the dataset. A question about the respondents' Hispanic, Latino(a), or of Spanish origin subgroup (i.e., Mexican, Mexican American, Chicano/a, Puerto Rican, Cuban or another Hispanic, Latino(a), or of Spanish origin) was present in the BRFSS 2017 Questionnaire, but not available for analysis. Instead, a calculated variable for Hispanics, derived from responses to that question, was made available to the research community. Specifically, the outputs were condensed by BRFSS staff to three options: respondents who reported being of Hispanic, Latino(a), or of Spanish origin, respondents who reported they were not of Hispanic, Latino(a), or of Spanish origin, and those who reported they did not know if they were of Hispanic, Latino(a), or of Spanish origin. Given this unexpected situation, I chose to focus the analyses on respondents who reported being of Hispanic, Latino(a), or of Spanish origin.

A total of 37078 respondents were identified as Hispanics and selected as the study sample, 61.5% of which could potentially be estimated to be Mexican Americans based on national statistics (USCB, 2020), although the actual percentage in this dataset could not be determined.

Respondents provided demographic information included age, gender, marital status, and employment status. Descriptive statistics of demographic information of the final sample are provided in Table 3. The majority of respondents were females (55.4%) and between the age of 25-44 (39.4%). Participants most frequently reported being married (45.2%), and employed for wages (46.4%).

Table 3

Demographic Characteristics

Characteristic	*N*	%
Gender		
Male	16524	44.6
Female	20534	55.4
Refused	20	.1
Total	37078	100.0
Age		
18-24	4415	11.9
25-34	7336	19.8
35-44	7268	19.6
45-54	6467	17.4
55-64	5572	15.0
65 or older	6020	16.2
Total	37078	100.0
Marital		
Married	16644	45.2
Divorced	4349	11.8
Widowed	2269	6.2
Separated	1836	5.0
Never Married	8762	23.8

A member of an unmarried couple	3001	8.1
Total	36861	100.0
Employment Status		
Employed for wages	17198	46.4
Self-employed	3213	8.7
Put of work for 1 year or more	1184	3.2
Out of work for less than 1 year	1325	3.6
A homemaker	4236	11.4
A student	1775	4.8
Retired	4761	12.8
Unable to work	2887	7.8
Total	37077	100.0

Data Cleaning

Evaluation of Statistical Assumptions

I conducted tests for multiple linear regression and binomial logistic regression statistical assumptions before beginning data analysis. This included addressing variable assumptions, and testing for multicollinearity, proportional odds, linearity, normality, and homoscedasticity. The findings of the evaluation of statistical assumptions are reported below.

Variable Assumptions

First, I addressed the variable assumptions. In binomial logistic regression, one or more independent variables must be measured as continuous, ordinal, or categorical variables. The independent variables in this study were measured at the ordinal or categorical level. Additionally, it is assumed that the dependent variable is measured on a dichotomous scale. The dependent variables, physical activity, fruit consumption, and vegetable consumption were measured as dichotomous variables. Therefore, the data meets the variable assumptions for the dependent and independent variables.

Normal Distribution

The variables were tested for skewness and kurtosis before beginning the data analysis to test for normal distribution. According to Westfall and Henning (2013), the critical values for skewness is +-2 and +-3 for kurtosis. A variable is considered asymmetrical when the skewness is ≥ 2 or ≤ -2 (Westfall & Henning, 2013). A variable's distribution varies from a normal distribution and has an increased likelihood to produce outliers when the kurtosis is ≥ 3 or ≤ -3 (Westfall & Henning, 2013). As shown on Table 4, all of the variables had values within the suggested limits indicating that study variables satisfied the assumption of normal distribution.

Table 4

Results of Skewness and Kurtosis for All Study Variables

Variable	Skewness	Kurtosis
Annual Income	.17	-1.46
Residual Income	.29	-.89
Education	.13	-1.29
Neighborhood Safety	.36	.96
Health Coverage	-1.25	-.43
Health Care Affordability	1.57	.46
Personal Health Provider	-.52	-1.73
Fruit Consumption	-.564	-1.682
Vegetable Consumption	-.790	-1.376
Sleep	.47	3.85
Physical Activity	-.67	-1.55

Multicollinearity

The assumption of multicollinearity applies to all three statistical tests. I assessed the assumption of no multicollinearity using Variance Inflation Factors (VIFs) values for all predictor or independent variables. According to Franke (2010), multicollinearity exists if the VIF is a large number exceeding 10. As shown in Table 5, the VIF for all

predictor variables is below 2.5, which indicates that all of the models meet the assumption of no multicollinearity.

Table 5

Multicollinearity Tests

	Fruit Consumption	Vegetable Consumption	Sleep	Physical Activity
Variable	VIF	VIF	VIF	VIF
Annual Income	1.53	1.52	1.63	1.53
Residual Income	1.29	1.28	1.30	1.28
Education	1.34	1.37	1.50	1.34
Neighborhood Safety	1.06	1.06	1.11	1.06
Health Coverage	1.40	1.39	1.34	1.39
Health Care Affordability	1.15	1.15	1.18	1.15
Personal Health Provider	1.20	1.20	1.17	1.20

Linearity

In multiple linear regression and binomial logistic regression, there is an assumption of linearity. Scatterplots of the standardized predicted values by residuals were evaluated to test linearity and homoscedasticity. A curvilinear pattern in the data points was not present in the scatterplot, indicating that the assumption of linearity was not violated in the multiple linear regression model. The functional relationship between the independent variables and dependent variable in the binomial logistic regression was linear in logit. The scatterplot for multiple linear regression is shown in Figure 1.

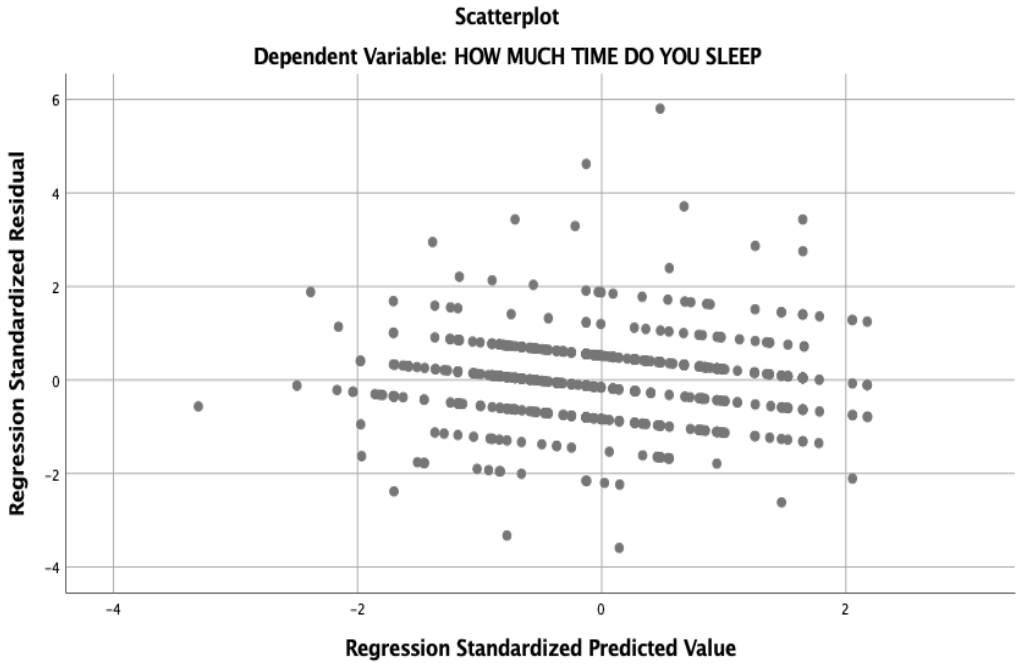
Homoscedasticity

The scatterplot was also used to test the homoscedasticity assumptions for multiple linear regression. As shown on Figure 1, the scatterplot shows points scatters

below and above the horizontal line, indicating that the assumption of homoscedasticity is not violated in this model. The model meets the assumption of homoscedasticity.

Figure 1

Scatterplot for Multiple Linear Regression Predicting Sleep

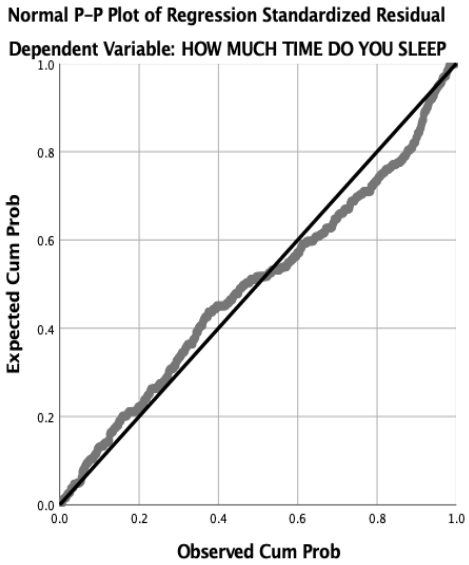


Normality

In multiple linear regression, there is also an assumption of normality. Normality was tested by observing the normal probability plot shown in Figure 2. In evaluating the normal probability plot, the residuals were found to be evenly or normally distributed along the line. Thus, the assumption of normality for the multiple linear regression is met.

Figure 2

Normal Probability Plot of the Standardized Residuals for Sleep



Summary of Statistical Assumptions

In summary, the data met all assumptions for multiple linear regression and binomial logistic regression. Therefore, the planned analysis in Chapter 3 (Table 2) was completed as planned.

Age and Gender Effects

As stated in Chapter 3 and based on extant literature that suggested effects of age and gender on study variables, I ran the analysis two ways: controlling for age and gender, and without controlling. Age and gender did not change the findings. Hence, adjusted findings are not reported for any of the analyses.

Results

Descriptive Statistics for Study Variables

Descriptive statistics for the categorical variables in this study are included in Table 6. Most frequently reported household income ranged between $15,000 to less than $25,000 (27.4%), followed by $50,000 or more (26.1%). Participants most frequently reported having just enough money to make ends meet (48.5%). Most participants had a high school education or less (54.8%). Most participants reported that they felt their neighborhood was safe from crime (64.2%). The majority of participants reported having some form of health care coverage (76.5%) and a personal doctor or health care provider (62.7%). Therefore, it is not surprising that only 19.2% reported being unable to see a doctor because of costs. The majority of respondents consumed fruits (63.6%) and vegetables (68.4%) one or more times a day. Lastly, most participants stated that they engaged in physical activity or exercise in the last 30 days (65.9%).

Table 6

Frequencies and Percentages for Categorical Variables

Variable	*N*	Valid %
Income		
Less than $15,000	6456	21.2
$15,000 to less than $25,000	8351	27.4
$25,000 to less than $35,000	3967	13.0
$35,000 to less than $50,000	3758	12.3
$50,000 or more	7974	26.1
Total	30506	100.0
Residual Income		
End up with some money left over	1734	36.0
Have just enough money to make ends meet	2336	48.5
Not have enough money to make ends meet	746	15.5

Variable	*N*	Valid %
Total	4816	100.0
Education		
Did not graduate High School	9540	25.9
Graduated High School	10678	28.9
Attended College or Technical School	8536	23.1
Graduated from College or Technical School	8136	22.1
Total	36890	100.0
Neighborhood Safety		
Extremely safe	1403	28.5
Safe	3161	64.2
Unsafe	316	6.4
Extremely unsafe	47	1.0
Total	4927	100.0
Health Care Access: Health Insurance		
No	8654	23.5
Yes	28231	76.5
Total	36885	100.0
Health Care Access: Personal Doctor or Heath Care Provider		
Yes, only one	23090	62.7
No	13762	37.3
Total	36852	100.0
Health Care Access: Participant needed to see a doctor but could not because of cost in last 12 months		
No	29831	80.8
Yes	7073	19.2
Total	36904	100.0
Diet: “Consume fruit 1 or more times per day”		
No	11960	36.4
Yes, consumed fruits one or more times a day	20868	63.6
Total	32828	100.0
Diet: “Consume vegetables 1 or more times per day.”		
No	10088	31.6
Yes, consumed vegetables one or more times a day	21798	68.4
Total	31886	100.0
Physical Activity in past month		

Variable	*N*	Valid %
No physical activity or exercise in last 30 days	11365	34.1
Had physical activity or exercise	21930	65.9
Total	33295	100.0

Note. Some of these items were optional, therefore not all states provided responses to these questions.

Sleep was the only continuous variable. Overall, respondents slept an average of 7.02 hours in 24 hours (*SD* = 1.452), with a range of 1 to 16 hours.

Hypothesis 1 – SDH Predict Diet

First, binomial logistic regression tests were conducted to test the null hypothesis below:

$H1_0$: SDH (income, education, neighborhood safety, and health care access), will not predict diet among Hispanics as measured by the BRFSS.

A binomial logistic regression of daily fruit consumption was conducted to determine if SDH are predictors of diet, as mentioned in RQ1, $H1_0$. I used the Hosmer and Lemeshow Test to determine the goodness of fit and the Omnibus Tests of Model Coefficients to determine the significance of the model. The Hosmer and Lemeshow Test was not statistically significant ($\chi^2 = 2.311$, $p = .970 > .05$), which indicates that the model is a good fit. The Omnibus Tests of Model Coefficients determined that the model is statistically significant, χ^2 (13)= 95.025, $p < .001$, and the model explained 2.5% (Cox & Snell R^2) to 3.5% (Nagelkerke R^2) of the variance in daily fruit consumption.

As determined by the Bonferroni correction, a *p*-value of .017 was used to evaluate significance. Results showed that income, residual income, education, and neighborhood safety were significant predictors of daily fruit consumption ($p < .017$).

The odds of daily fruit consumption are 30.9% greater, Exp (B) = 1.309, 95% CI (1.055, 1.625), in those with an income of $15,000 to less than $25,000 than those with less than $15,000. Not having enough money to make ends meet is associated with decreased odds of eating fruits by nearly 48.4%, Exp (B) = .516, 95% CI (.409, .650) compared to having some money left over. The odds of eating fruits are 33.8% greater, Exp (B) = 1.338, 95% CI (1.056, 1.694), in those who have graduated college or technical school than those who did not graduate high school. Decreased neighborhood safety is associated with a decrease in the odds of daily fruit consumption by nearly 16.2%, Exp (B) = .838, 95% CI (.745, .942). Health care coverage, health care affordability, and having a personal health provider were not statistically significant predictors of daily fruit consumption ($p > .017$).

In short, daily fruit consumption can be predicted by annual income, residual income, education, and neighborhood safety. The results for the binomial logistic regression analysis are shown in Table 7.

Table 7

Binomial Logistic Regression with SDH Predicting Fruit Consumption (n = 3775)

Variable	B	S.E.	Wald	*df*	Sig.	Exp(B)
(Constant)	1.121	.174	41.364	1	.001	3.067
Annual Income			14.327	4	.006	
Annual Income $15,000 to less than $25,000	.269	.110	5.970	1	.015	1.309
Annual Income $25,000 to less than $35,000	.200	.129	2.404	1	.121	1.221
Annual Income $35,000 to less than $50,000	.120	.137	.766	1	.381	1.128
Annual Income $50,000 or more	-.094	.129	.534	1	.465	.910
Residual Income			32.916	2	.001	
Residual Income: Have just enough money to make ends meet	-.149	.083	3.228	1	.072	.861

Residual Income: Not have enough money to make ends meet	-.662	.118	31.512	1	.001	.516
Education			22.990	3	.001	
Education: Graduated High School	-.126	.099	1.613	1	.204	.882
Education: Attended College or Technical School	-.186	.105	3.119	1	.077	.830
Education: Graduated College or Technical School	.291	.120	5.836	1	.016	1.338
Neighborhood Safety	-.177	.060	8.731	1	.003	.838
Health Coverage	-.060	.091	.441	1	.506	.941
Health Care Affordability	-.131	.089	2.190	1	.139	.877
Personal Health Provider	.109	.078	1.973	1	.160	1.115

Note. $P < .017$

A binomial logistic regression of daily vegetable consumption was also conducted to determine if SDH were significant predictors of diet, as mentioned in RQ1, $H1_0$. I used the Hosmer and Lemeshow Test to determine the goodness of fit and the Omnibus Tests of Model Coefficients to determine the significance of the model. The Hosmer and Lemeshow Test was not statistically significant ($\chi^2 = 5.430$, $p = .711 > .05$), which indicates that the model is a good fit. The Omnibus Tests of Model Coefficients determined that the model is statistically significant, χ^2 (13)= 290.897, $p < .001$, and the model explained 7.5% (Cox & Snell R^2) to 10.8% (Nagelkerke R^2) of the variance in daily vegetable consumption.

A *p*-value of .017 was used to evaluate significance as determined by the Bonferroni correction. Results showed that annual income, residual income, and education were significant predictors of daily vegetable consumption ($p < .017$). The odds of daily vegetable consumption are 54.9% greater, Exp (B) = 1.549, 95% CI (1.169, 2.052), in those with an income of $50,000 or more than those with an income less than $15,000. Not having enough money to make ends meet is associated with decreased odds

of consuming vegetables by nearly 41.4%, Exp (B) = .586, 95% CI (.458, .749) compared to having some money left over. The odds of eating vegetables are 63% greater, Exp (B) = 1.630, 95% CI (1.343, 1.977), in those who have graduated high school than those who did not graduate high school. The odds of vegetable consumption increase as educational levels increase. Neighborhood safety, health care coverage, health care affordability, and having a personal health provider were not statistically significant predictors of daily vegetable consumption ($p > .017$).

In summary, annual income, residual income, and education are predictors of daily vegetable consumption. The results for the binomial logistic regression analysis are shown in Table 8.

Table 8

Binomial Logistic Regression with SDH Predicting Vegetable Consumption (n = 3722)

Variable	B	S.E.	Wald	*df*	Sig.	Exp(B)
(Constant)	.323	.182	3.133	1	.077	1.381
Annual Income			12.191	4	.016	
Annual Income $15,000 to less than $25,000	.037	.113	.107	1	.744	1.038
Annual Income $25,000 to less than $35,000	.077	.134	.336	1	.562	1.080
Annual Income $35,000 to less than $50,000	.169	.145	1.359	1	.244	1.185
Income $50,000 or more	.438	.143	9.305	1	.002	1.549
Residual Income			18.181	2	.001	
Residual Income: Have just enough money to make ends meet	-.200	.091	4.834	1	.028	.819
Residual Income: Not have enough money to make ends meet	-.535	.125	18.180	1	.001	.586
Education			90.425	3	.001	
Education: Graduated High School	.488	.099	24.554	1	.001	1.630
Education: Attended College or Technical School	.857	.111	59.929	1	.001	2.356

Education: Graduated College or Technical School	1.100	.131	70.680	1	.001	3.004
Neighborhood Safety	-.095	.065	2.108	1	.147	.910
Health Coverage	.186	.094	3.969	1	.046	1.205
Health Care Affordability	.179	.095	3.503	1	.061	1.196
Personal Health Provider	.164	.083	3.868	1	.049	1.178

Note. The *df* value for all variables was 1. $P < .017$

In summary, the first null hypothesis, that SDH (income, education, neighborhood safety, and health care access), will not predict diet among Hispanics as measured by the BRFSS is rejected. *The data support that income, education, and neighborhood safety are predictors of diet in Hispanic adults.*

Hypothesis 2 – SDH Predict Sleep

I used multiple linear regression to address the null hypothesis below:

$H2_0$: SDH (income, education, neighborhood safety, and health care access), are not predictors of sleep among Hispanics as measured by the BRFSS.

A multiple linear regression analysis was conducted to determine if SDH are significant predictors of sleep. The results of the overall model was statistically significant, $R^2 = .078$, $F(13, 518) = 3.300$, $p < .001$. The R^2 value of .078 associated with this overall regression model suggests that the predictors account for 7.8% of the variation in sleep, which means that 92.2% of the variation in sleep cannot be explained by these predictors alone. Thus, I can reject the null hypothesis ($H2_0$) that SDH are not predictors of sleep among Hispanics.

As previously mentioned, a *p*-value of .017 was used to evaluate significance to conform with the Bonferroni correction. The multiple linear regression analysis revealed that education is a significant predictor of sleep ($p < .017$). Sleep time is significantly less

for individuals who graduated high school (β = -.166, *t* = -3.315) or attended college or technical school (β = -.198, *t* = -3.768) compared to not having graduated high school. Annual income, residual income, neighborhood safety, health care coverage, health care affordability, and having a personal health provider were not statistically significant predictors of sleep ($p > .017$).

In summary, the overall model determined that the second null hypothesis, SDH will not predict sleep can be rejected. *The data supported that education is a statistically significant predictor of sleep among Hispanics.* The results of the multiple linear regression predicting sleep are shown in Table 9.

Table 9

Multiple Linear Regression with SDH Predicting Sleep Behavior (n = 519)

	Unstandardized		Standardized			95 % CI	
Variable	B	S.E.	B	*t*	Sig.	Lower	Upper
(Constant)	7.584	.291		26.045	.001	7.012	8.156
Annual Income $15,000 to less than $25,000	.299	.187	.085	1.596	.111	-.069	.667
Annual Income $25,000 to less than $35,000	-.196	.215	-.046	-.914	.361	-.618	.225
Annual Income $35,000 to less than $50,000	.131	.231	.029	.568	.570	-.323	.585
Annual Income $50,000 or more	-.343	.231	-.095	-1.486	.138	-.796	.110
Residual Income: Have just enough money left over	.052	.154	.017	.334	.739	-.252	.355
Residual Income: Not have enough money left over to make ends meet	-.338	.232	-.074	-1.461	.145	-.794	.117

Education: Graduated High School	-.586	.177	-.166	-3.315	.001	-.933	-.239
Education: Attended College or Tech School	-.730	.194	-.198	-3.768	.001	-1.111	-.349
Education: Graduated College or Tech School	-.285	.228	-.074	-1.248	.213	-.733	.164
Neighborhood Safety	.001	.113	.000	.007	.994	-.222	.224
Health Coverage	.001	.159	.000	.004	.997	-.313	.314
Health Care Affordability	-.340	.174	-.091	-1.953	.051	-.682	.002
Personal Health Provider	.224	.137	.074	1.632	.103	-.046	.494

Note. $P < .017$

Hypothesis 3 – SDH Predict Physical Activity

I conducted a binomial logistic regression to investigate the null hypothesis below:

$H3_0$: SDH (income, education, neighborhood safety, and health care access), will not predict physical activity among Hispanics as measured by the BRFSS.

A binomial logistic regression analysis was conducted to investigate if SDH are predictors of physical activity. I used the Hosmer and Lemeshow Test to determine the goodness of fit and the Omnibus Tests of Model Coefficients to determine the significance of the model. The Hosmer and Lemeshow Test was not statistically significant ($\chi^2 = 12.223$, $p = .142 > .05$), which indicates that the model is a good fit. The Omnibus Tests of Model Coefficients determined that the model is statistically significant, χ^2 (13)= 222.459, $p < .001$, and the model explained 5.6% (Cox & Snell R^2)

to 7.8% (Nagelkerke R^2) of the variance in physical activity engagement. Therefore, I can reject the null hypothesis ($H3_0$) that SDH do not predict physical activity.

A *p*-value of .017 was used to evaluate significance to conform with the Bonferroni correction. Results showed that annual income, residual income, and education were significant predictors of physical activity ($p < .017$). The odds of engaging in physical activity are 67.9% greater, Exp (B) = 1.679, 95% CI (1.295, 2.176), in those with an income of $50,000 or more than those with an income less than $15,000. Not having enough money to make ends meet is associated with decreased odds of engaging in physical activity by nearly 51.4%, Exp (B) = .486, 95% CI (.386, .613) compared to having some money left over. The odds of engaging in physical activity are 47.8% greater, Exp (B) = 1.478, 95% CI (1.225, 1.783), in those who have graduated high school than those who did not graduate high school. The odds of physical activity engagement significantly increase as educational levels increase. Neighborhood safety, health care coverage, health care affordability, and having a personal health provider were not statistically significant predictors of physical activity ($p > .017$).

In summary, the overall model determined that the third null hypothesis, SDH will not predict physical activity among Hispanics, can be rejected. The data supported that *income and education are statistically significant predictors of physical activity among Hispanics.* The results of the binomial logistic regression predicting physical activity are presented in Table 10.

Table 10

Binomial Logistic Regression with SDH Predicting Physical Activity (n = 3871)

Variable	B	S.E.	Wald	*df*	Sig.	Exp(B)
(Constant)	.597	.173	11.899	1	.001	1.817
Annual Income			17.621	4	.001	
Annual Income $15,000 to less than $25,000	.137	.107	1.638	1	.201	1.147
Annual Income $25,000 to less than $35,000	.221	.127	3.042	1	.081	1.247
Annual Income $35,000 to less than $50,000	.133	.136	.953	1	.329	1.142
Annual Income $50,000 or more	.518	.133	15.270	1	.001	1.679
Residual Income			38.561	2	.001	
Residual Income: Have just enough money to make ends meet	-.194	.085	5.189	1	.023	.824
Residual Income: Not have enough money to make ends meet	-.721	.118	37.471	1	.001	.486
Education			43.716	3	.001	
Education: Graduated High School	.391	.096	16.694	1	.001	1.478
Education: Attended College or Technical School	.580	.105	30.683	1	.001	1.786
Education: Graduated College or Technical School	.702	.120	34.430	1	.001	2.018
Neighborhood Safety	-.121	.061	3.937	1	.047	.886
Health Coverage	-.094	.090	1.089	1	.297	.910
Health Care Affordability	-.084	.089	.899	1	.343	.919
Personal Health Provider	.104	.078	1.744	1	.187	1.109

Note. The *df* value for all variables was 1. $P < .017$

Summary

The purpose of the data analysis was to determine whether SDH in the 2017 BRFSS (income, education, neighborhood safety, and health care access), were statistically significant predictors of health behaviors measured by the 2017 BRFSS (diet, sleep, and physical activity) among Hispanics. Binomial logistic regression and multiple linear regression were used to test the research question and hypotheses. The assumptions for the statistical analyses were tested and met.

The analyses revealed that income is a statistically significant predictor of Hispanics' diet and physical activity. Education is a significant predictor of diet, sleep,

and physical activity. Neighborhood safety is a statistically significant predictor of diet. Health care access was not a statistically significant predictor of diet, physical activity, or sleep among Hispanics. Overall, the results show that SDH are statistically significant predictors of health behaviors among Hispanic adults.

In Chapter 5, I will discuss the interpretation of the findings, study limitations, recommendations, implications, and conclusions relating to this study.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this study was to evaluate the under-researched relationships between SDH (income, education, neighborhood safety, and health care access) and health behaviors (diet, sleep, and physical activity) of Mexican Americans in the United States using data collected in 2017 in the BRFSS. Although the 2017 BRFSS questionnaire asked specifically about Mexican American ethnicity, the data available for analyses combined Mexican Americans with Puerto Ricans, Cubans, or another Hispanic, Latino(a), or of Spanish origin under a *Hispanic* category. This is the sample that was used in the analysis. The key findings showed that SDH are statistically significant predictors of health behaviors in the Hispanic population. This chapter will cover the interpretation of the findings, limitations, recommendations, implications, and concluding thoughts. I will first present my interpretations of the SDH findings and then focus on each health behavior studied.

Interpretation of the Findings

Social Determinants of Health and Health Behaviors

A disparity between Hispanics and non-Hispanic income and education levels persists in the United States, whereas Hispanics have substantially less income and education than non-Hispanic whites (Beltrán-Sánchez et al., 2016; Gándara & Mordechay, 2017). Income and education were significant SDH associated with Hispanics' health behaviors in this study. Income and education are highly correlated. Having a higher education means people have a greater opportunity to earn higher

income (Flink, 2018). Individuals with low income and education have fewer opportunities to facilitate healthy behaviors because they lack the resources needed to adopt healthy behaviors and rely on different sources for health information (Brunello et al., 2016; Dudley et al., 2017). On the other hand, having higher educational attainment helps individuals understand health information and opens the opportunity to make decisions that positively affect one's health (Brunello et al., 2016). Individuals adapt to their available resources, which is why negative health behaviors (diet and physical activity) are seen when income and education are low.

Income and education determine where people live and are associated with neighborhood safety (Baker, 2014; Beltrán-Sánchez et al., 2016; Lindsay et al., 2018). Neighborhood safety is highly correlated with the quality of local services, including health services, education, and employment opportunities that may be available around the area, which have an impact on someone's health behaviors (Kaplan et al., 2019; Organista et a., 2017; Perez et al., 2019). An individual could lack access to healthy foods and safe places to exercise depending on their neighborhood. Higher neighborhood safety encourages healthy behaviors and makes it easier for an individual to maintain them, while poor neighborhood safety worsens individuals' chances to exhibit healthy behaviors (Kaplan et al., 2019; Perez et al., 2019). A lack of neighborhood safety reinforces social disadvantages such as not having nearby sources of healthy foods or employment and educational opportunities (Kaplan et al., 2019; Lindsay et al., 2018; Organista et a., 2017; Perez et al., 2019). This explains why neighborhood safety is

associated with diet, and while it was not statistically significant, the results showed that those in unsafe neighborhoods showed lower engagement in physical activity.

Health care access was not found to contribute to Hispanics' health behaviors in this study. Health care access could be more impactful if the other factors (income, education, and neighborhood safety) did not exist. Lower income individuals qualify for Medicaid, a federal and state program that provides healthcare funding assistance to low-income families (Valle & Perez-Lopez, 2020). In 2018, 31.3% of Medicaid enrollees were Hispanics under the age of 65 (Lucas & Benson, 2019). Individuals with higher income and education can afford other forms of health insurance. Having Medicaid helps those individuals with lower income and education access the same health care resources that those in higher income and education categories already have available (Valle & Perez-Lopez, 2020).

The BRFSS measurements for healthcare access were based on coverage status and affordability. These questions do not provide information on whether the individuals seek care and utilize their healthcare coverage. Literature showed that Hispanics tend to avoid seeking care even if they have insurance coverage due to fear and anxiety (Findling et al., 2019; Torres et al., 2018), which may have impacted this study's results.

The findings showed that Hispanics experience negative health behaviors, even with various federal and state assistance programs available to help counterbalance the adverse effects of SDH on their health behaviors. The findings in this study were from a large sample across the United States and its territories, strengthening the information

provided in previous conforming literature. SDH create challenges and help shape risk factors for Hispanics to develop and sustain negative health behaviors.

Diet

For the first hypothesis, I examined whether SDH (income, education, neighborhood safety, and health care access) were predictors of diet among Hispanics. The research associated with Hispanics suggested that as individuals adapt to living in the United States, they consume fewer fruits and vegetables (Arandia et al., 2018; Lindsay et al., 2018). Literature also showed that Hispanics with lower income and education find it more challenging to consume the necessary daily food intakes because they lack the necessary resources to purchase healthier foods (Potochnick et al., 2019; Rabbitt et al., 2016). Those with a lack of health care utilization have also been found to exhibit inadequate dietary behavior due to not acquiring available and accessible health consultations needed to make healthy choices (Lee et al., 2017; Stang & Bonilla, 2018).

I evaluated diet through daily consumption of fruits and vegetables. Although the majority of the respondents reported that they consumed fruits and vegetables daily, more than 3 out of 10 reported not doing so. Annual income, having more money left over at the end of the month, education, and increased neighborhood safety is associated with higher odds of eating fruits. Similarly, the odds of vegetable consumption were higher in those with higher annual income, leftover income, and educational levels. Health care access was not associated with fruit or vegetable consumption. Individuals with higher income and education tend to understand healthy nutrition and can afford to purchase healthy foods (Brunello et al., 2016), which explains the higher fruit and vegetable

consumption amongst adults in these categories. Overall, SDH (income, education, and neighborhood safety) are predictors of diet among Hispanics in the United States.

The majority of Hispanics in this study reported eating at least one serving of fruits and vegetables regardless of their income, educational attainment, or neighborhood safety. Fruits are a big part of the cuisine in the Hispanic culture (Valerino-Perea et al., 2019; Tam et al., 2017), which may explain these findings. Although not assessed in the present study, another possible explanation might be that they use government programs to supplement their income. Low-income individuals can qualify for the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) and Supplemental Nutrition Assistance Program (SNAP), which provides funding and resources for low-income families to purchase food and obtain nutrition education. In 2017, 60% of Hispanics were covered through WIC (United States Department of Agriculture [USDA], 2020), and approximately 32.5% of those families were also covered by SNAP (Valle & Perez-Lopez, 2020). These programs help low-income families who lack resources obtain necessary fruit and vegetable consumptions.

Overall, the study findings are consistent with existing literature on the effects of income and education in Hispanics' diet behaviors (Potochnick et al., 2019; Rabbitt et al., 2016; Velasco-Mondragon et al., 2016). SDH can influence the quality of the food an individual consumes because it can limit how much a person can afford, what is accessible, and their understanding of healthy nutrition (Potochnick et al., 2019; Rabbitt et al., 2016). Additionally, these findings contribute to the current literature by providing insight into the association between neighborhood safety and diet behaviors in the

Hispanic population. Specifically, the determination that a lack of neighborhood safety is associated with unhealthy diet behaviors. Furthermore, health care access was not associated with diet among Hispanics. This contradicts current literature, which states that health care access influences the dietary characteristics Hispanics exhibit by providing important health consultations needed to make healthy dietary choices (Lee et al., 2017; Stang, & Bonilla, 2018).

Adequate dietary behaviors are essential to maintain healthy lifestyles (Velasco-Mondragon et al. 2016). Unhealthy dietary habits hinder the ability of Hispanics to uphold healthy lives due to the risk they pose on the individual's wellbeing. Diet is known to be one of the leading causes of disparities es Hispanics are facing. The results support the need for interventions to help Hispanics counteract the adverse effect poor SDH can have on their diet.

Sleep

In the second hypothesis, I explored whether SDH (income, education, neighborhood safety, and health care access) were predictors of Hispanics' sleep. Based on the literature, I hypothesized that SDH would be predictive of sleep. According to Dudley et al. (2017) and Patel et al. (2015), income and education predict sleep patterns. Poor economic and neighborhood safety conditions can interrupt adequate sleep by depriving individuals from the resources needed to develop proper sleep hygiene and causing additional stress that is known to disturb sleep (Alcántara et al., 2017; Lindsay et al., 2018; Patel et al., 2015). Recently, Hispanics have faced increased sociocultural

stressors that have disturbed their sleep quality by causing daytime sleepiness and insomnia symptoms (Alcántara et al., 2017).

Hispanics had an average of 7.02 hours of sleep at night. The study results showed that education is predictive of sleep among Hispanic adults. Individuals with a high school diploma, and those who attended college or technical school experienced shorter sleep duration. Income, neighborhood safety, health care access were not found to be associated with Hispanics' sleep.

These findings support existing literature that shows an association between education and sleep (Dudley et al., 2017; Patel et al., 2015). Patel et al. (2015) found that having a low level of education is a predictor of both short and long extremes of sleep time. This study supports evidence that Hispanics with a high school level education have short sleep duration. On the other hand, the study results regarding income, neighborhood safety, and health care access are inconsistent with existing evidence suggesting that low income and adverse neighborhood safety conditions play a role in poor sleep outcomes in Hispanics (Alcántara al., 2017; Lindsay et al., 2018; Patel et al., 2015). Lower income levels and poor neighborhood safety conditions create stressors that interrupt sleep duration (Alcántara al., 2017; Lindsay et al., 2018).

Current literature suggests that Mexican American Hispanics exhibit better sleep behaviors than other Hispanic subgroups (Dudley et al., 2017). This may have impacted the results given that the study sample consisted of all Hispanic subgroups, and Mexican Americans account for a large portion of the sample (USCB, 2020). Additionally, the instrument used to measure sleep was based on the total hours an individual slept within a

24 hour period. This measurement is widely used in research to examine sleep behavior and is a valid and reliable measurement to determine an individual's sleep duration (Jungquist et al., 2016). However, this measurement does not account for a participant's sleep issues, sleep quality, sleep opportunity, or daytime sleepiness, which are also important factors in examining sleep behaviors (Jungquist et al., 2016). Hence, an individual could be getting longer hours of sleep but still be affected by other sleep disturbances like low sleep quality and daytime sleepiness.

Insufficient sleep quality and other sleep issues put Hispanics at a greater risk of developing psychological and physiological health issues (Alcántara et al., 2017; Dudley et al., 2017). A lack of proper sleep hygiene puts individuals at risk for diabetes and heart disease, conditions that are already disproportionately prevalent among Hispanics (Dudley et al., 2017; Hammig et al., 2019; Hoffman et al., 2020; Velasco-Mondragon et al., 2016). This study supports the need to address sleep duration issues related to education attainment in the Hispanic community.

Physical Activity

In the third hypothesis, I explored whether SDH (income, education, neighborhood safety, and health care access) are predictive of physical activity engagement in Hispanics. I hypothesized that SDH would be predictive of Hispanics' physical activity engagement. Previous literature showed that income, neighborhood safety, and health care access are connected to physical activity, specifically lower physical activity (Lindsay et al., 2018; Silfee et al., 2016; Stang & Bonilla, 2018; Stasi et al., 2019). Hispanic adults with lower income and education have more physically

demanding jobs, budget constraints, and unsafe neighborhoods that serve as barriers to get adequate physical activity (Arredondo et al., 2016).

Most Hispanics in this study had engaged in physical activity or exercise in the past month when data collection took place. The findings showed that annual income, having money left over at the end of the month, and education were predictive of physical activity among Hispanics. Participants were more likely to engage in physical activity when they had higher incomes, leftover income, and educational levels. Similarly, physical activity engagement decreased as an individuals' income, leftover income, and educational levels decreased. Neighborhood safety and health care access were not significant predictors of physical activity. Conclusively, SDH are predictors of Hispanics' physical activity engagement.

These results supported existing knowledge that indicates physical activity is influenced by income and education in Hispanics (Jáuregui, Salvo, et al., 2020; Stasi et al., 2019). Those with lower income exhibit poor physical activity behaviors. Additionally, these findings add to the current literature by establishing that education is a predictor of Hispanics' physical activity. Having higher levels of income and education opens the opportunity for individuals to have the necessary financial resources to address certain barriers like financial restrictions, family obligations and access to fitness facilities (Abraído-Lanza et al., 2017; Dellaserra et al., 2018). This gives individuals with higher income and education advantages over those with lower income and education in getting adequate physical activity. This would explain how individuals with lower

income and education display lower physical activity engagement than those in the higher income and education categories.

Conversely, the study results regarding neighborhood safety and health care access are inconsistent with current literature which state that individuals with poor neighborhood safety (Murillo et al., 2019; Perez et al., 2019) and a lack of health care access tend to engage in inadequate physical activity (Stang & Bonilla, 2018). Similar to other health behaviors, not having the appropriate resources interferes in developing healthy behaviors like adequate physical activity.

Adequate physical activity is a vital factor in preventing adverse health outcomes and maintaining good health (Gauri et al., 2017). A lack of physical activity could lead to adverse health outcomes in Hispanics and is one of the main contributors to health conditions (diabetes, obesity, and cardiovascular disease) that are disproportionately affecting Hispanics in the United States (Hammig et al., 2019; Hoffman et al., 2020; Velasco-Mondragon et al., 2016). On the other hand, engaging in regular physical activity can help reduce disease risk and help individuals maintain good health and wellness. Health initiatives are needed for Hispanics in lower income and education categories to help negate SDH's challenges on having sufficient physical activity.

Theoretical Framework

The findings aligned with the cumulative inequality (CI) theory, which explains that inequalities are developed based on available resources (Ferraro & Shippee, 2009; Merton, 1988). These inequalities can expand into various areas of an individual's life, including their health (Ferraro & Shippee, 2009). The CI theory links various SDH-

related constructs to the disadvantage individuals experience and the development of life trajectories, which lead to inequality (Ferraro & Shippee, 2009). Life trajectories are the actions individuals choose to carry out that determine their path in life. Regarding this study, health behaviors are the actions that participants express.

The CI theory asserts that social structures shape behaviors (Ferraro & Shippee, 2009). Hispanics that lack income, education, and neighborhood safety exhibit more inadequate health behaviors. Their social structure (income and education) and available resources are creating disadvantages and affecting their health behaviors. This creates an inequality that is structurally generated and accumulates over a person's lifetime (Ferraro & Shippee, 2009).

Furthermore, the CI theory conveys that disadvantage increases risk exposure, whereas advantage increases opportunity (Ferraro & Shippee, 2009). This study showed that Hispanic adults with poor SDH display poor health behaviors, and those with advantageous SDH exhibit beneficial health behaviors. Through the CI theory reasoning, SDH can function as a risk or an increased opportunity to develop good health behaviors. The theory also suggests that life trajectories are developed by accumulating risks, resources, and human agency (Ferraro & Shippee, 2009). The health behaviors Hispanics adopted were associated with SDH. According to the theory, human agency, or the capacity for an individual to make choices, can shape and modify life trajectories or, in this case, health behaviors (Ferraro & Shippee, 2009).

In summary, Hispanic adults' health behaviors were reported and related to fundamental SDH variables, which conforms with the CI theory reasoning. The extent of

SDH is linked to whether Hispanics have higher risks of developing harmful health behaviors or a greater opportunity to establish positive health behaviors. This continues to be a problem that is disproportionately affecting the Hispanic community. The health care community and policy makers in the United States should be used to guide efforts that help increase equal opportunities and promote healthy behaviors among Hispanic adults.

Limitations of the Study

This research is subject to some key limitations based on the use of secondary data. The limitations that impacted this study included the accessibility to a limited number of SDH. I was unable to access all SDH identified in the literature. The BRFSS had a limited number of self-reported instruments to measure SDH and health behavior constructs. Hence, I was unable to use a wider variety of valid and reliable instruments for some of the variables. As an example, the BRFSS measurements for diet did not indicate whether the servings were enough to meet dietary standards. The measurements only indicated whether the individual consumed at least one serving of fruits or vegetables. Individuals may have had only one serving of fruit and vegetables per day, which does not meet the recommended nutritional guidelines of two cups of fruit and two and a half of vegetables per day for adults (USDA & HHS, 2015). Individuals could be displaying other risky dietary habits that were not captured in the data. For instance, the results did not capture the consumption of low nutritional value and calorie-dense foods and beverages, which could have present in combination with fruit and vegetables

consumption. These risky dietary habits are currently contributing to the high obesity prevalence across Hispanic subgroups (Velasco-Mondragon et al., 2016).

On the other hand, through use if the BRFSS I was able to access a large sample size and all valid responses to improve the generalizability and reliability of the findings. Using this secondary data was time and cost-effective.

Another limitation is that I could only examine relationships between the variables but unable to evaluate causation or perceived impact. It is possible that some of the health behaviors were caused by specific SDH. Examining the causation and perceived impact of SDH on health behaviors could provide further information on Hispanics' experiences. Epidemiological research with large and longitudinal datasets is more apt for this type of research question.

Finally, conclusions were made on the data collected in 2017, a challenging sociopolitical time for Hispanics (Roche et al., 2018). Since approximately 2015, Hispanics have been facing a rise in racial tensions, ethnic discrimination, and abrupt policy changes, which has resulted in increased psychological distress and health behavior changes (Raymond-Flesch, 2018; Roche et al., 2018). From that time, Hispanics are experiencing sudden changes in their occupation, educational opportunities, and living situation due to policy changes (Raymond-Flesch, 2018). This factor may have impacted the answers of respondents to the BRFSS data.

Recommendations

This study included Hispanic adults, 18 years or older, living in the United States. I recommend that research be conducted on Mexicans in the United States, especially in

states with a higher percentage of Mexican American residents, to establish associations between a wider variety of SDH and health behaviors within the Mexican American population. Furthermore, I recommend that these studies be conducted longitudinally, as SDH conditions and health behaviors for Mexican Americans may change over time.

For each of the health behaviors measured in the present study, the use of secondary data meant that the instruments were much more basic than existing valid and reliable measures. Future research should try to use these more psychometrically sound instruments that measure more SDH constructs in ways that are unavailable in the BRFSS, with a sample as large and representative as the one included in this study. Data collection was conducted in English or Spanish to accommodate Spanish-speaking Hispanics' needs or preferences (CDC, 2018), a methodological strength that should be considered when using other instruments. Additionally, future research should examine the experiences of individuals who are impacted by these SDH and have poor health behaviors to better understand how they are related and the meaningfulness for the individual.

Generational status is utilized when observing differences in Mexican American cultural norms and lifestyles (Reininger et al., 2017; Toth-Bos et al., 2020). Generational status is a measure of time since immigration. First generations are the original immigrants, Second generation are their children, and so on. Generational status was not included in the existing BRFSS dataset. Therefore, these nuances were not studied. The exclusion of generational status did not impact collecting the necessary information to

draw conclusions for this study. However, I recommend that future studies consider evaluating the role generational status may play in Hispanics' health behaviors.

Researchers, health professionals, and policymakers should take a multidisciplinary approach to address the relationship between SDH and health behaviors among Hispanics. Professionals should seek out and implement initiatives that address key components of SDH (income, education, and neighborhood safety) influencing health behaviors. Efforts should be placed on building a positive relationship with the Hispanic community and promoting health equity. I recommend forming meaningful collaborations within local Hispanic communities to reach those in need of intervention and utilize the collaborates to generate and disseminate valuable health information specific to the Hispanic population.

Implications

This study can contribute to social change by helping Hispanics, like Mexican Americans and their health care providers, understand how specific SDH (income, education, neighborhood safety, and health care coverage) influence their health behaviors (diet, sleep, and physical activity). Understanding the relationship between SDH and health behaviors can help health care professionals develop new treatment approaches and policies that promote a positive diet, sleep, and physical activity behaviors. This study provides information that can improve Hispanic patients' health knowledge, health care access, and satisfaction to help this population overcome challenges to optimal health. The knowledge presented in this study can be integrated

into existing literature to help leaders and health care professionals develop community-focused health initiatives.

Conclusion

The 2017 BRFSS was used to determine the extent to which income, education, neighborhood safety, and health care access predicted health behaviors (diet, sleep, and physical activity) in the United States Hispanic population. The results showed that SDH (income, education, and neighborhood safety) predict health behaviors in Hispanic adults. Income, education and neighborhood safety predict diet, income and education predict physical activity, and education predicts sleep. Hispanics with lower income, education, and neighborhood safety exhibit disadvantageous health behaviors. Health care access was not found to be associated with any of the health behaviors. The findings contribute to the literature and extends the knowledge on how SDH predict health behaviors in the Hispanic population and highlights existing behavioral health issues that can be addressed through health education, policy development, and community-focused initiatives.

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