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EXPLORING DIET, PHYSICAL ACTIVITY, AND SELF-REPORTED
HEALTH STATUS AMONG INDIVIDUALS IN THE MEDICALLY
UNDERSERVED POPULATION

by

KELLEY R. DEVOE

A thesis submitted in partial fulfillment of the requirements
for Honors in the Major Program in Education and Human Performance
in the College of Education
and in the Burnett's Honors College
at the University of Central Florida
Orlando Florida

Spring Term, 2018

Thesis Chair: Dr. Anna Valdes

ABSTRACT

The primary purpose of this study is to determine if certain lifestyle and health behaviors (e.g. smoking, physical activity, diet) in the medically underserved population have any influence on particular health statuses. This study also looked to determine if these health behaviors resulted in particular medical ailments being more prevalent or specific to this community. The secondary purpose of this study aims to gain information that may help health care providers practicing in this community to earlier identify risk factors in patients before a medical problem becomes more severe, difficult and expensive to treat. A survey, adapted from the CDC's Behavioral Risk Factor Surveillance System (BRFSS), was created to allow for the collection of descriptive statistical data. The survey contains questions on the various topics of diet, physical activity, chronic diseases, and self-perception of overall health status. The survey was distributed to 20 older adult participants at Hebni Nutrition, LLC, all from disadvantaged backgrounds. Descriptive statistics were used to analyze the data. Of the 20 surveys collected, about half of the respondents reported consuming close to the recommended fruit and vegetable servings and participating in regular physical activity. Furthermore, the participants reported rates of diabetes and hypertension well above average. This study's results were inconclusive as to whether any *specific* health behaviors among medically underserved individuals influence the prevalence of chronic diseases in this population; more likely a combination of many factors and overall poorer health habits that persist over a lifetime are contributors to chronic diseases among the medically underserved population.

DEDICATION

To my Mom and Dad, for their unfailing love, guidance, and overwhelming support. For giving me all the tools I needed to succeed and instilling in me the confidence that I am capable.

To Kim, my sister and best friend, for her constant motivation, inspiration, and perfectly timed humor when needed most.

To Tyler, for literally being there for me by my side every step of the way. For always being in my corner, and my biggest fan. You are my rock.

And to my Grandma, who I could always count on for wise words and encouragement any time, day or night.

I truly would not be who I am or where I am without each of you.

From the bottom of my heart,

Thank you.

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CHAPTER ONE: INTRODUCTION

Known as the “forgotten minorities,” the medically underserved population includes individuals who are living in a particular location with a shortage of primary health care services. It is common for underserved individuals to face economic, cultural, or linguistic barriers to health services (Health Resource & Service Administration, 2016). According to the U.S Department of Health & Human Services (2017), there are 3581 medically underserved areas (MUAs) in the United States. These areas are most heavily concentrated in the southern states like Virginia, Florida, Texas, and New Mexico and the very north states like Montana and North and South Dakota (U.S Department of Health and Human Services, 2017). One of the strongest and most consistent predictors of a person’s morbidity and mortality is poor socioeconomic status (SES). SES, which is defined as the social standing of an individual or group, is most often assessed by following factors: income, occupation, and education (Winkleby, Jatulis, Frank, & Fortmann, 1992). The factors of SES are very much interrelated and each variable reflects different individual and societal forces that associate with health and disease. For example, income tends to reflect purchasing power, housing, medical care, and diet; occupation measures prestige, responsibility and work exposures; while education indicates skills for positive social, psychological and economic resources (Winkleby, Jatulis, Frank, & Fortmann, 1992). Low SES can be directly correlated to individuals living in MUAs and also underlies many major determinants of an individual’s overall health (Alder, Boyce, Chesney, Cohen, Folkman, Kahn, & Syme, 1994). According to a study done by Steenland, Hu, and Walker (2004) which looked at mortality by SES, they found that the percentage of all deaths attributable to being in the lowest three SES quartiles was 27%. This statistic is quite frankly, shocking, as it indicates

that almost a third of the researched populations deaths were due simply to the factors surrounding their social class. Unfortunately, for a variety of reasons, individuals with lower SES are more susceptible to serious chronic diseases such as; diabetes, cancer, cardiovascular disease, and many more. Lower SES individuals may be prone to unhealthy habits and behaviors due to a lifestyle associated with food insecurity, fewer opportunities for physical activity, limited access to healthcare, and a lack of knowledge and/or education on the problems they face. Therefore, the main purpose of this study is to investigate if certain health behaviors in the medically underserved population have any influence on particular health statuses.

Previous work conducted by Pincus, Callahan, and Burkhauser (1987) provides further support for the proposed study. This study examined self-reported health problems for individuals at four different education levels in a national sample of 5,652 people. Although this study is a bit dated, the conclusions are still valid and relevant. They found that that 32 of the 37 diseases they assessed were all dominant at the lowest educational level, proving that those with a lower education level were more likely to contract a disease. For diseases like nervous, emotional or mental conditions, arthritis, vision trouble, heart attack, various cardiovascular issues, and chronic lung issues, the odds of suffering from one of those diseases was anywhere from five to fifteen times higher if an individual only had eight years of formal education compared to 12+ years of education. They concluded that the lower an individual's education level the greater the chance for mortality as well as major decline in functional capacity over a nine year span (Pincus, Callahan, & Burkhauser, 1987). Factors that further increase the risk of chronic disease include tobacco use, poor diet, and lack of proper exercise. A study done by Pampel, Krueger, and Denney (2010) provides evidence that the incidence of these risk factors

tends to be higher with lower SES individuals. Their study looked at education, occupation, income and type of housing compared to smoking, exercise, and obesity. Individuals with only a basic education (0-11 years) were almost four times more likely to smoke, five times more likely to not exercise, and almost two times more likely to be obese. Those with labor and service type occupations and a low income were two times more likely to smoke, three times more likely to not exercise, and were almost two times more likely to be obese. Finally, for individuals who rent their housing verses own, they were almost two times more likely to smoke and not exercise.

Although many studies have examined the health behaviors of individuals among lower SES, most usually concentrate on only one or two variables, i.e. just exercise or just nutrition habits (Booth, Roberts, & Laye, 2014; European Milk Forum, 2015). However, this study is multi-factorial and will examine a variety of different health behaviors and health statuses and determine if there is a possibility that health behavior or status influence one another.

Determining if some health behaviors or factors influence others, and to what degree, could aid in shaping the future of preventive (primary and secondary) healthcare efforts targeted to this specific population. Furthermore, a study like this one, that focuses on the results of individuals health behaviors, it could aid in improving and increasing access to public education of proper health habits, and allow physicians to perform an overall more complete health examination of their patients. This complete health examination should address not only the complaint that brings the patient in that day, but also pay attention to the possible related or influencing ailments commonly known to be more prevalent to the specific population of the patient (the medically underserved). This may allow the physician to catch a minor problem, one the patient

may not even be aware of yet, instead of allowing the issue to go unresolved until the patient is in a much more serious condition.

Purpose

The primary purpose of this study looks to determine if certain lifestyle and health behaviors (e.g. smoking, alcohol consumption, physical activity, diet) in the medically underserved population have any influence on particular health statuses. This study also looked to determine if these health behaviors resulted in particular medical ailments being more prevalent or specific to this community. The secondary purpose of this study aims to gain additional information that may help health care providers practicing in this community to earlier identify risk factors in patients before a medical problem becomes more severe, difficult and expensive to treat.

CHAPTER TWO: LITERATURE REVIEW

The following sections provide evidence on how diet, physical activity, and different health choices and behaviors all have the ability to affect an individual's ultimate health status or outcome. Unfortunately or fortunately, depending on perspective, contraction of some of the most common yet deadly diseases (like cardiovascular diseases) are very much within an individual's control. The knowledge of a healthy diet and proper exercise regimen usually begins with adults and is hopefully passed to their children. Establishing healthy habits and patterns of behavior in the earlier years of childhood and adolescence may actually be the difference between life versus an early death. Even some of the smallest health choices or behaviors made early on could have a large impact on an individual's wellbeing years later.

Nutrition and Health

Proper nutrition plays a significant role in promoting health and preventing disease. From the earliest periods in our lives, our diet greatly impacts our well-being and determines future health outcomes. Nutrition influences the proper growth and development of the body during childhood, adolescence, and into adulthood. It also plays a major role in the proper maintenance of physiological processes and in the biological process of aging (European Milk Forum, 2015). Poor nutritional habits are associated with an increase the risk of acute and chronic disease such as overweight and obesity, cardiovascular disease, Type 2 diabetes and some cancers. Poor health puts an enormous burden on individuals, families and society as a whole.

The foundation of a balanced diet is the proper intake of fruits and vegetables (Rugel & Carpiano, 2015). Adequate intake of fruits and vegetables has been linked to reductions in

stroke, cancer, depression and many chronic diseases (Rugel & Carpiano, 2015). A recent Swedish research team (Rugel & Carpiano, 2015) found that there was a 53% lower mortality rate among individuals who consumed at least five servings of fruit of vegetables per day, which is the current recommended dosage as stated in the study by Baker and Wardle, (2003). As important as nutrition is to an individual's health, many do not heed recommended advice.

Dietary Habits of Low SES

Unfortunately, a study done in Britain found that the average intakes of fruit and vegetables seemed to be no more than three servings a day, out of the recommend five (Baker & Wardle, 2003). They also found that women tend to consume more fruit and vegetables than men (Baker & Wardle, 2003). It was concluded that women ate significantly more fruit and vegetables than men (3.5 verses 2.5 servings, respectively), and only 16% of men versus 34% of women claimed to eat the fully recommended five servings (Baker & Wardle, 2003). This gender discrepancy is not unheard of and many other studies support this claim. Baker and Wardle (2003) proposed several reasons for this, some of which include taste preferences (women reported liking vegetables more versus men reported liking fruits more) and lack of knowledge of the relationship between consumption of fruits and vegetables and their positive effects of reduction of disease (28% verses 35%, men to women). Another study conducted by Rugel and Carpiano (2015) also looked at the differences between men and women and adequate fruit and vegetable consumption. Their study found that overall only about 40% of the participants consumed the proper five servings a day, with women consuming more than men. The study also found that the more highly educated with a higher household income status was more likely to

consume the proper portions (Rugel & Carpiano, 2015). Unfortunately, there were very few, if any studies found that that addressed the fruit and vegetable consumption of individuals in the medically underserved population, hence the need for the current study.

While fruits and vegetables are very important, a healthy diet is much more than that. Other factors such as a high intake of fiber/whole grain, unsaturated fats, vitamins/minerals, and fish are all important variables to a well-rounded diet (Fagerli & Wandel, 1999). Studies conducted in both Norway and Finland looked at many different practices of a healthy diet of with occasional mention of SES (Fagerli & Wandel, 1999); (Roos, Lahelma, Virtanen, Prattala , & Pietinen, 1998) . When it came to opinions about food and health both men and women in Norway and Finland generally agreed that the food they ate was important for their health, but when asked about the choice of healthy foods, women tended to report more than men that they would choose the healthier foods (Fagerli & Wandel, 1999); (Roos, Lahelma, Virtanen, Prattala, & Pietinen, 1998). Further results showed that the higher the education level of both men and women, the greater the consumption of fresh fruits, vegetables, and overall healthy foods like whole grains and vitamins (Fagerli & Wandel, 1999). The results of the aforementioned research studies may play an influential role in the reason that women tend to live longer than men.

A final important part of an individual's diet is the consumption of alcohol. While not generally harmful when in proper moderation, alcohol has the propensity to be abused. A study conducted by Oers, Bongers, Goor, and Garretsen (1999) looked at alcohol consumption and related SES. It was found that for men, excessive drinking was more prevalent in the lowest educational group. On the other hand, for women, no significant relation between educational level and prevalence of excessive drinking was found (Oers, Bongers, Van de Goor, &

Garretsen, 1999). Other studies have looked at alcohol consumption and related mortality risk. In one such study, a direct dose response relation was found to exist between alcohol consumption and risk of death in men and women (White, Altmann, & Nanchahal, 2002). The study concluded that the more alcohol an individual consumes, the more likely the alcohol consumption would be related to their cause of death. One study found that some of the most common diseases associated with excess alcohol consumption included cancer of the mouth and throat, hypertension, and hemorrhagic stroke (White, Altmann, & Nanchahal, 2002). Furthermore, a substantially increased risk for mortality has been reported in those even drinking lower than the recommended dosage, especially among younger people like teens and adolescents. (White, Altmann, & Nanchahal, 2002).

A nutritious, smart, and balanced diet is vital in maintaining a healthy mind and body. The nutrients an individual consumes is converted into energy to fuel physical activity and exercise. The proper amount of physical activity is just as important as nutrition for maintaining an individual's wellbeing.

Physical Activity

Next to diet, physical activity is another important element to keeping a healthy body. Physical inactivity has been proven to be a major independent risk factor from chronic disease (Seefeldt, Malina, & Clark, 2002). Many barriers to physical activity exist among adults whom attempt to adopt and maintain a physically active lifestyle. Some of the most common barriers include older age, state of personal health, one's self efficacy, SES, and social and physical environments (Seefeldt, Malina, & Clark, 2002). An individual's age and state of health are

cornerstone to their ability to exercise. As an individual ages, their body undergoes physical changes to some degree, and the changes vary greatly by individual and previous lifestyle. Some of the most common changes include a decline of muscle mass, a decrease in body density and strength, a slowing metabolism, and a decrease in heart and lung efficiency. To compensate for these changes, older individuals are encouraged to participate in physical activity and exercise for at least 30 minutes, three to five times a week (Besdine, 2016). Many studies have found that the benefits of physical activity greatly outweigh the risks (Besdine, 2016). Some of the benefits include the preservation of skeletal muscle and bone strength which increases mobility and independence and reduces fall related injuries, reduced risk of obesity, reduced risk of chronic diseases, opportunities for social interaction, and an enhanced personal sense of well-being (Besdine, 2016). Furthermore, in terms of personal health, two factors which could greatly impact an individual's health and therefore their ability to perform physical activity are alcohol consumption and smoking. One such study explored the associations of physical activity with smoking and alcohol use based on adult sport club membership. It was found that heavy drinking was associated with being a member of a sports team, while smoking was less commonly associated (Poortinga, 2007). So while being a member of a sports team is beneficial for physical activity, the associated heavy drinking is not; and could potentially have negative effects later in life.

Other studies looked at leisure-time physical activity participation and how it is affected by SES. Both studies found that physical inactivity was most common among lower social class and minority groups (Leslie & Cerin, 2008; Marshall, et al., 2007). More interestingly, of the two studies mentioned, the study done by Leslie and Cerin (2008) found that poor self-efficacy,

social support and physical barriers were the most prevalent among disadvantaged segments of the population and the reasons for reduced physical exercise. In addition, a study conducted in Australia backs the claim that many neighborhoods in urban, disadvantaged areas were perceived by individuals to be too hazardous due to traffic and crime, which posed physical activity barriers to outdoor exercising (Kavanagh, et al., 2005). Self-efficacy, social support, and attitudes towards exercising among individuals in lower SES communities was also very low (Leslie & Cerin, 2008). In line with the many other works discussed, studies by Corti and Donovan (2002) and Plotnikoff, et al. (2004) reiterate the need for a supportive environment to encourage physical activity; whether it be through social groups like exercise classes, or the sheer proximity of exercise facilities to communities.

An individual's self-efficacy and the social support they have has become one of the most major determinants of participation in physical activity (Plotnikoff, Mayhew, Birkett, Louciades, & Fodor, 2004). There is a great need for community based support that is aimed at reducing inactivity, the need for spreading knowledge throughout disadvantaged communities on the benefits of an active lifestyle, and the importance of teaching behavioral skills to improve self-efficacy in order to spread positive behavior. In terms of physical activity, self-efficacy, and support between men and women, the same study by Plotnikoff et al. (2004) finds that men tend to engage in physical activity more and have a higher proportion of friends who do as well, compared to women. In addition, the factors influencing men and women to engage in exercise are different (Plotnikoff, Mayhew, Birkett, Louciades, & Fodor, 2004). Many studies have found that men tend to work out for themselves. They are more internally motivated to gain or lose weight and therefore are more willing to participate in physical activity (Silberstein, Striegel-

Moore, Rodin, & Timko, 1988). Women on the other hand tend to work out to look good for others and due to their weight dissatisfaction and desire to lose weight (Silberstein, Striegel-Moore, Rodin, & Timko, 1988). The motivation is more external and therefore sometimes harder for women to find or keep up the desire to exercise. Women tend to exercise more if they have the support from others (Sallis, 1992). These findings are further backed by a study that looked at the adoption and maintenance of vigorous physical activity between men and women and found that predictors of exercise for men were identified as self-efficacy and predictors for women were self-efficacy and social support (Sallis, 1992).

Socioeconomic Status and Reported Health Status

As expected, many studies have analyzed the correlation between SES and the overall health status of an individual; however, studies done specifically in MUA's are lacking (Adler, et al., 1994; Braveman, Cubbin, Egerter, Williams, & Pamuk, 2010; Hemingway, Nicholson, & Marmot, 1997). Many of these studies were conducted using the self-reported health status of an individual verses being medically examined and reported by a physician. Due to the self-reporting, results may not be completely accurate; however, relevant data can still be obtained. In many different studies, the same conclusion was made: those of lower SES are more likely to report a poorer health status (Kennedy, Kawachi, Glass, & Prothrow-Stith, 1998; Johansson & Sundquist, 1997; Hemingway, Nicholson, & Marmot, 1997; Adler, et al., 1994). A study done by Winkleby (1992), states that education level is often the most commonly used component of SES to measure risk factors for disease contraction. It is reported that education may protect against disease by influencing lifestyle behaviors, problem-solving, and may facilitate positive social,

psychological, and economical skills. The study also reiterated that peer groups and higher self-efficacy and self-esteem may play a role in positive health behaviors and an overall higher self-reported health status. On a related note, in both the studies by Sundquist (1997) and Harper (2007), it was found that living alone while also having a low education level was closely related to increased mortality (Johansson & Sundquist, 1997; Harper & Lynch, 2007).

On another note, one aspect of health that is often overlooked, but is just as important is an individual's sleeping pattern. Sleep can play a large role in obesity, Type 2 diabetes, heart disease, hypertension, and other metabolic effects (Chaput, 2014). The hours of sleep an individual is supposed to get at night is generally based upon their age. One study reports that women sleeping seven to eight hours were least likely to show weight gain, while those sleeping only five to six hours were about 44% more likely to gain weight (Patel, Malhorta, White, Gottlieb, & Hu, 2006). Also, a study by Farnsworth (2015) correlated sleep and physical activity levels and found that middle aged women who are less active are more likely to develop sleep disorders which lead to the inability to maintain a proper sleeping schedule (Farnsworth, Kim, & Kang, 2015). Women's propensity to participate less in physical activity may play a role in lack of sleep and weight gain. These types of negative lifestyle behaviors create a vicious cycle and lead to the decline of the overall health of an individual.

Current research supports the view that diet, physical activity, and certain health behaviors are very much intertwined when it comes to an individual's overall health and wellbeing. As many studies have examined the effects of health behaviors and lifestyle habits on individuals of both higher and lower SES, not many have addressed the factors in specifically medically underserved areas. Although low SES and MUA's may overlap, they are not one in

the same. An individual may be of lower SES but that does not necessarily mean they live in a MUA. This study created is specifically looking at individuals who live within an MUA community.

CHAPTER THREE: METHODOLOGY

In order to gain information that may help health care providers practicing in the medically underserved community identify risk factors in their patients, the health behaviors of the medically underserved population must be investigated to determine if such behaviors have any influence on particular health lifestyles or health statuses. It must also be determined if these health behaviors result in certain medical ailments being more prevalent or specific to this community. This methodology chapter provides information regarding the sampling method and research setting, target and survey population, survey instrument, procedures, and statistical analysis.

Sampling Method

The sampling method of this research study was a convenience sample selected for the purpose that it matched the population of interest, and the organization, Hebni Nutrition Consultants, LLC, was willing to participate in the study. The participants of this research study came from a nutrition class held by this organization. Hebni Nutrition Consultants is a community based, not for profit organization located in downtown Orlando, Florida, in a medically underserved area. Downtown Orlando, located in Orange County is a confirmed, Governor Defined medically underserved area by the US Department of Health and Human Services (US Department of Health and Human Services, 2018). The goal of the organization is to serve and educate the high-risk, culturally diverse population about nutrition strategies to help prevent diet-related diseases. They do so by informing participants on how they can make simple, healthy nutritional changes to try and avoid or reduce the risk of disease contraction.

More specifically, Hebni's programs seek to serve the African-American population who may be at a higher risk for serious chronic diseases such as cardiovascular disease, cancer, diabetes and obesity.

Target Population and Survey Participants

The target population of Hebni Nutrition includes the individuals living in the medically underserved area of Washington Shores in downtown Orlando. The majority of participants attending Hebni's nutrition classes are from minority populations and underserved communities, the same population of individuals recruited for this research study.

Instrument

The survey used in this study, created by referencing and adapting the already existing CDC's BRFSS, consisted of 12 health behavior questions and seven demographic questions. Two multiple choice questions addressed dietary habits, asking participants about their fruit and vegetable consumption per day/week/month, and general alcohol consumption. Another four questions, both multiple choice and write-in, addressed physical activity habits and asked about involvement in regular physical activity, what type of exercise, how many times a week, and for how many minutes per session. Two questions, multiple choice and write-in, aimed to address participant's health behaviors by asking about smoking habits and how many hours of sleep an individual gets each night. Two "select all that apply" questions inquired about any chronic diseases (diabetes, heart attack, etc.) individuals may be suffering from and any secondary symptoms (fatigue, vision changes, etc.) participants may be experiencing. These questions provided individuals with a list of some of the most common chronic diseases and symptoms and

allowed participants to check all that applied. Lastly, two multiple choice questions addressed participants self-perceived health status and asked individuals to rate their overall health in addition to how satisfied they are with their life. The end of the survey asked participants to provide their demographic data like age, sex, height/weight, income, education, and occupation. These questions were both multiple choice and write-in. The survey is completely anonymous, no names were collected, and was provided to participants in English. After completing the IRB certification course, this study's research protocol was IRB approved (see Appendix A for letter of approval). A sample of the survey is provided (see Appendix B).

Procedures

After creating the survey, 30 copies were printed for distribution. Hebni Nutrition was personally visited by the primary investigator, Kelley Devoe, to distribute the research survey in person. An introduction by the primary investigator to the individuals running the Hebni nutrition class was made, and then the surveys were distributed as participants of the class arrived and signed in. The participants were allowed to take the survey back to their table and fill it out at their leisure. After about an hour and a half, most surveys had been filled out and returned to the primary investigator, however, the primary investigator did address the class at the end of the session to collect any remaining surveys and thank everyone for their time and participation.

Statistical Analysis

In order to better understand the sample of respondents, descriptive statistics were generated. The frequencies for age, gender, race, income, education, and BMI were broken down and analyzed (see Table 1). As the primary purpose for this study was to determine if certain health behaviors in the medically underserved community have any influence on certain health statuses, and then further determine if these health behaviors resulted in particular medical ailments being more prevalent or specific to this community, descriptive statistics were used for analysis. Using the descriptive statistics, factors of diet, physical activity, and self-reported health status permitted a reporting of the general assessment of the participants' overall health. The results of the research survey were compared with the Florida and national averages as reported by the 2016 BRFSS. This comparison will help assess the health habits and lifestyle practices of individuals living in a MUA compared to the general population.

CHAPTER FOUR: RESULTS

The purpose of this study was to investigate if certain health behaviors in the medically underserved population had any influence on particular health lifestyles or health statuses. In addition, the study also looked to determine if these health behaviors resulted in certain medical ailments being more prevalent or specific to this community. Determining if certain health statuses are more prevalent to this population may allow health care providers practicing in this community to earlier identify the risk factors of severe chronic diseases in their patients. Therefore, after distributing the survey to individuals participating in a nutrition class held by Hebni Nutrition Consultants, LLC, 20 total survey responses were obtained. Unfortunately, not all participants answered all the questions, so some data is more limited than others. Analyzing the results of the surveys collected should help determine if there are any certain health behaviors in the medically underserved population that have any influence on certain health statuses of the individuals who make up that community. It will further help determine if these health behaviors result in particular medical ailments being more prevalent or specific to this community. The results of the survey may also aid fulfilling the secondary purpose of this research which is to gain additional information that may help health care providers practicing in this community to earlier identify risk factors in patients before a medical problem becomes more severe, difficult and expensive to treat.

Demographics

The majority of the individuals who participated in this study survey were African American. There were a few were Hispanic and a couple white individuals. Most individuals were middle age or older, but there were a few younger, college age individuals as well. Some of the participants came to the nutrition class with family members or brought their children. All but a couple of the participants were very overweight or obese, a common risk factor among Hebni members.

In terms of specific demographic data, the average age of the participants completing the survey was 50 years old, ranging from 18 to 70 years of age. Of the 20 participants, 75% reported their race/ethnicity to be African American, while 10% reported Hispanic, 10% reported Israelite, and 5% did not report. Of the total, 60% of the participants were female and 40% were male. The average monthly income was around \$3,200 a month and the reported occupations include teacher, payroll assistant, entrepreneur, Uber/Lyft driver, Publix worker, manager, and retired. Of the reported education level, 5% had less than a high school education, 25% had at least a high school education, 10% had an associate's degree, and 50% reported having a bachelor's degree. None of the participants reported having higher than a bachelor's degree. Height and weight were also self-reported and resulting BMI's were calculated (see Table 1). Unfortunately, only nine participants reported both their height and weight to allow for BMI calculation. Table 1 provides a complete breakdown of all demographic data reported by survey participants including age, gender, race, education level, income level, and BMI. All the data concisely displayed in provides insight and a well-rounded overview of the population being studied.

Table 1. Reported Demographics of Survey Participants

	n (%)
Age	
≤25	1 (5%)
26-30	1 (5%)
31-35	2 (10%)
36-40	3 (16%)
41-45	0 (0%)
46-50	1 (5%)
51+	11 (58%)
No Report	1 (5%)
Gender	
Male	8 (40%)
Female	12 (60%)
Race	
African American	15 (75%)
Hispanic	2 (10%)
Israelite	2 (10%)
No Report	1 (5%)
Education	
Less than HS	1 (5%)
HS	2 (11%)
Associates	5 (27%)
Bachelors	10 (55%)
Masters+	0 (0%)
No Report	2 (10%)
Income	
< \$1000	1 (10%)
\$1000 - \$1999	1 (10%)
\$2000 - \$2999	3 (30%)
\$3000 - \$3999	2 (20%)
\$4000 +	3 (30%)
No Report	10 (50%)
BMI	
Normal	0 (0%)
Overweight	3 (33%)
Obese	2 (22%)
Extremely Obese	4 (44%)
No Report	11 (55%)

Dietary Habits

Of the 12 questions on the survey, two questions asked specifically about dietary habits. The questions addressed fruit and vegetable consumption in addition to alcohol consumption. When asked how often they eat fruit and vegetables, 55% of the participants claimed to eat fruits and vegetables a few times a day. The percentage of those who claimed a few times a week was 35%, and 10% claimed a few times a month. When asked if they drink alcohol, and how much, 60% claimed no alcohol consumption while 40% claimed they drink alcohol sometimes or on a special occasion. See Tables 2 and 3.

Table 2. Reported Fruit and Vegetable Consumption by Survey Participants.

	“A few times a day”	“A few times a week”	“A few times a month”	“Never”
How often do you eat fruits and/or vegetables (not including juice)?	55%	35%	10%	0%

Table 3. Reported Alcohol Consumption by Survey Participants.

	“Often”	“Sometimes/special occasion”	“No”
Do you drink alcohol?	0%	40%	60%

Physical Activity

Next, four survey questions addressed physical activity habits and inquired the type, how often, and for how long individuals exercise. Of all the participants, 35% of individuals reported doing no regular physical activity. The remaining individuals, 65%, reported exercising an average of 2.7 times a week for an average of about 37 minutes. The various types of exercises reported by the participants included walking, dance/hula hoop, playing sports, biking, weight lifting, yard work, and manual labor at work. See Tables 4 and 5.

Table 4. Reported Physical Activity of Survey Participants.

	“Yes”	“No”
Do you participate in regular physical activity?	65%	35%

Table 5. Reported Physical Activity Time of Survey Participants.

	“Less than 30 min”	“30min-60min”	“60+ min”
How long do you do this physical activity/exercise?	44%	33%	23%

Self-reported Health and Lifestyle

The remaining questions on the survey inquired about an individual's health habits, lifestyle, and other health related conditions such as chronic diseases and mental health. Participants were asked whether or not they smoke cigarettes and 100% of individuals reported they do not smoke. Another survey question addressed the total number of hours participants sleep at night. The average hours slept at night as reported by participants is about 6.4 hours, with hours slept ranging from as little as 3 hours a night to as much as 10 hours a night. Further question inquired about any chronic diseases they individuals may be or have suffered from and then any current negative health symptoms that may be currently present. The survey presented some of the most common chronic diseases including heart attack, diabetes, asthma/lung disease, musculoskeletal problems, and hypertension (blood pressure of 140/90+). Participants were allowed to select more than one condition. Of the 11 individuals that answered the question, there was 1 report of asthma/lung disease, 1 report of a heart attack, 7 reports of diabetes, 1 report of musculoskeletal problems, a report of thyroid problems, and 7 reports of high blood pressure. Many of the chronic diseases recounted were not reported in isolation or alone, but rather in combination with other chronic conditions. For example, almost all of the participants who reported having diabetes also reported having high blood pressure, too. Table 6 provides a visual representation of the various chronic diseases reported by survey participants. The data is displayed in a way that allows for the systemic nature of many of the participant's illnesses to be pronounced; for example, the high rate of diabetes in combination with high blood pressure is clear. Reported diseases are marked with an "X" and the occurrence of multiple diseases by a single participant can be seen.

Table 6. Chronic Diseases Reported by Survey Participants.

		Participants										
		1	2	3	4	5	6	7	8	9	10	11
Chronic Diseases	Heart attack											X
	Diabetes		X	X	X	X	X	X			X	X
	Asthma/Lung	X										
	Musculoskeletal									X	X	
	High Blood Pressure (above 140/90)		X		X	X	X		X			X
	Other										X	

The question of current negative health symptoms being experienced included options like reoccurring headaches, stomachs, cold/flu like symptoms, anxiety/nervousness, allergies, fatigue, vision changes, and muscle/joint pains; and again, participants were allowed to select more than one condition. Of the 14 participants who chose to answer the question, there were 7 reports of muscle/joint pains, 2 reports of anxiety/nervousness, 2 reports of vision changes, 4 reports of fatigue, 1 report of stomachaches, 2 reports of allergies, 2 reports of cold/flu like symptoms, and 2 reports of no symptoms at all. Table 7 provides a visual representation of the various secondary symptoms reported by survey participants. Just as in Table 6, the data displayed in Table 7 also allows for a more complete overview of participants reported symptoms. Reported symptoms are marked with an “X” and the occurrence of multiple symptoms by a single participant can be seen.

Table 7. Secondary Symptoms Reported by Survey Participants.

		Participants											
		1	2	3	4	5	6	7	8	9	10	11	12
Secondary Symptoms	Reoccurring Headaches												
	Reoccurring Stomachaches									X			
	Cold/flu symptoms				X							X	
	Muscle/joints pains	X	X	X			X	X	X		X		X
	Anxiety/nervousness					X			X				
	Allergies		X				X						
	Fatigue			X		X				X		X	
	Vision changes		X						X				

The remaining two questions of the survey addressed the mental health and self-perception aspect of the individual on a very basic level. The survey asked participants to rate their overall general health as they perceive it and the other question asked the participants how satisfied they are with their lives. In terms of the general health, all 20 participants answered the question and 10% perceived their overall health as excellent, 65% perceived their overall health as good, 15% as fair, and 10% as poor. All participants chose to answer the life satisfaction question as well, and of the 20 answers received 60% reported being very satisfied with their life, 30% reported somewhat satisfied, and 10% claimed not satisfied. See Tables 8 and 9.

Table 8. General Health Perception as Reported by Survey Participants.

	“Excellent”	“Good”	“Fair”	“Poor”
Would you say your general health is:	10%	65%	15%	10%

Table 9. Life Satisfaction as Reported by Survey Participants.

	“Very satisfied”	“Somewhat satisfied”	“Not satisfied”
How satisfied are you with your life?	60%	30%	10%

CHAPTER FIVE: CONCLUSION

After analyzing the data and results of the survey, it is fair to conclude that individuals who are part of the medically underserved population tend to report poorer health behaviors than the general population. Lower reports of fruit and vegetable consumption, less exercise, and higher reports of chronic diseases all influence and perpetuate an individual's poorer health status. Prolonged, negative health behaviors that are not corrected eventually result in decline health, as seen in the patients of this research study.

Demographics

Of the individuals who attended the Hebni nutrition class and participated in this research study, 75% were African American. This statistic is a very accurate representation of the percentage of African Americans living in MUA's nation-wide. Many studies done by The American Psychological Association address the reason for this (Braveman, Cubbin, Egerter, Williams, & Pamuk, 2010; Fiscella, Franks, Gold, & Clancy, 2008; Williams, Mohammed, Leavell, & Collins, 2010). While SES plays a large role, educational attainment, opportunities and privileges, financial security, subjective perceptions of social status or class, and societal pressures or expectations all attribute to a higher percentage of African Americans living in MUAs (American Psychological Association, 2018). The gender demographic of participation in the nutrition class was not surprising due to the fact that statistically, women tend to care and take charge of their overall health more than men (Sieverding, 2002; Courtenay, McCreary, & Merighi, 2002). Although not as common as decades ago, women still tend to be the individuals in the house who provide the meals and tend to the children (Savage, Fischer, & Birch, 2007). It

is reasonable to believe that more women would attend a nutrition class as they hope to learn new positive health behaviors for not only themselves, but their children and partners as well.

In regards to the participants reported income, education, and employment, these participants seemed to be on the higher end for MUAs. As the average monthly income reported by participants was around \$3,200 a month, which is almost three times the poverty threshold for a single individual (Institute for Research on Poverty, 2016). However, no data was collected on how many individuals contributed to the monthly income in each household that the survey participant may be supporting, as that could change the discussion entirely. Although, at \$3,200 a month, which is about \$38,000 a year, participants would not qualify as “poverty” unless they were trying to support seven individuals in a household—a situation that is usually not common (Institute for Research on Poverty, 2016). It should be noted that \$3,200 a month is close to the average income per month for the entire state of Florida according to the BRFSS survey (Centers for Diseases Control and Prevention, 2016). In addition, ten of the 20 participants (50%) reported having a bachelor’s degree, which is more than 20% higher than the Florida average of only 27% individuals reporting a Bachelor’s degree (United States Census Bureau, 2016; Centers for Diseases Control and Prevention, 2016). Having said all this, the participants of the survey, although living in an MUA, seem to be higher on the socioeconomic ladder than expected.

Dietary Habits

Although this research is not specifically addressing the differences in male versus female health habits, fruit and vegetable consumption is often compared between the genders as a means of analyzing health behaviors and shedding light on possible reasons for the unequal

distribution of chronic diseases among males and females. As research notes it is more common for men to pay less attention to their health, this may be one of the reasons that men tend to have a shorter life expectancy than women (Barford, Dorling, Smith, & Shaw, 2006). In terms of the results of the survey, the slight majority (55%) claimed to eat fruits and vegetables a few times a day, which is slightly less than the Florida average for fruit and vegetable consumption which sits around 60 to 70%. However, the 55% is more closely related to the data collected from previous studies on fruit and vegetable consumption in older adults, such as those done by Baker and Wardle in 2003. When broken down between genders in the current study, 66% of females reported consuming fruits and vegetables a few times a day verses only 37.5% of men reported eating fruits and vegetables a few times a day. Although both percentages are higher than the reported averages that various studies have seen, the discrepancy between the genders is incredibly high. The discrepancy is also very prevalent to not only MUAs but the general population as well. These statistics are disappointing for individuals who have been partaking in a nutrition class and receiving free, public education on the topic of proper nutrition for disease prevention. On a more positive note, due to the fact that many studies have reported alcohol consumption being linked to lower education levels, it appears as no coincidence that the low reports of alcohol consumption by the participants in this survey are possibly due to their higher levels of education. Age may also play a factor as it is more common for younger individuals to participate in heavier drinking than older individuals, especially those suffering from chronic diseases like diabetes or hypertension as the survey participants here reported.

Physical Activity

Exercising and being physically active is incredibly important in the prevention of heart disease and stroke, the nation's number one and number five killers (American Heart Association, 2017). According to the American Heart Association (AHA), the recommended amount of exercise to make a difference in improving overall health is at least 150 minutes per week of moderate exercise or 75 minutes per week of vigorous exercise, or some combination of the two (American Heart Association, 2017). Usually individuals should aim for 30 minutes, 5 times a week (American Heart Association, 2017). Unfortunately, many individuals throughout our country do not exercise anywhere close to that amount even when resources are available. For individuals living in MUAs, exercise may be even harder to participate in due to any number of reasons addressed in the studies discussed previously. Of the individuals at Hebni who contributed to the survey and answered the question, 35% reported no participation in regular physical activity or exercise. Of this 35%, the gender break down is 71% female and 29% male. This is not a surprising result many studies have shown that men tend to participate in physical activity more than women (Plotnikoff, Mayhew, Birkett, Louciades, & Fodor, 2004). One individual explained further that their lack of exercise is due to recovering from an ankle injury, but the others were not asked to elaborate. Of the other individuals who did claim to participate in regular physical activity or exercise, the average was only 2.7 times a week for an average of 37 minutes. When calculated, this is only 99 minutes of exercise a week; 51 minutes shy of the weekly recommend. According to the BRFSS survey, only about 21% of individuals throughout the state of Florida exercise (aerobic, strength training) for the recommended amount of time (Centers for Diseases Control and Prevention, 2016). Having said this, only 15% of the surveyed

individuals from Hebni reported to exercise for the AHA recommended time frame, which is about 6% lower than the general Florida average. Although no doubt exists that some exercise is better than none, it is unclear how much benefit these individuals are really seeing from their exercise routines. It would be interesting to understand the reasons for the lack of physical activity. Is it due to the underserved environment in which these individuals reside (as it could be assumed), or are there other factors at play? As many of the survey participants reported suffering from chronic diseases such as diabetes, hypertension, and musculoskeletal issues, perhaps they have not been medically cleared to exercise any more than they are.

Self-reported Health and Lifestyle

Research studies have shown that individuals living in MUAs are more prone to suffering from chronic diseases due to lack of physical activity, poor nutritional and health habits, and the many factors that accompany low SES. Fortunately all participants reported no smoking, which is a huge risk factor for cancer and chronic lung and cardiovascular diseases. Whether they had been a smoker in the past or how recently they may have quit was not asked, but either way, being a nonsmoker is a positive health attribute to have. According to the National Sleep Foundation, adults age 26 years and older require an average of 7 to 9 hours of sleep a night to maintain proper health and body functions (National Sleep Foundation, 2018). Prolonged sleep deprivation, even if just a couple hours a night can lead to high blood pressure, weight gain, diabetes, heart attack, stroke, and many more serious disease (National Sleep Foundation, 2018). Unfortunately, the average hours of sleep reported by the survey participants was just under the recommended average. A few individuals even reported sleeping as little as 3, 4, or 5 hours,

which is not ideal for maintaining proper health; especially in these individuals who are reportedly already suffering from serious conditions like obesity, diabetes, and high blood pressure. Although Hebni mainly addresses nutrition, it may be beneficial for the organization to address the importance of proper sleep (if they do not already) due to the fact the sleep plays such an integral role in the management of the chronic diseases Hebni is trying to help prevent. The latter part of the survey asked participants to select any chronic diseases from which they may be suffering. Unfortunately, chronic diseases seemed common among the survey participants as 81% of the individuals suffered from diabetes, hypertension or a combination of both; much higher than the Florida diabetes and hypertension average of about 15%, according to the BRFSS (Centers for Diseases Control and Prevention, 2016). Diabetes and hypertension are the “gateway diseases” to much more serious health issues like cardiovascular disease. From previous survey answers it is known that at least one of the survey participants has already had a heart attack. An astonishing study published in 2009 found that African-Americans have a much higher incidence of heart failure than other races, in addition to it developing at a younger age (Bibbins-Domingo, et al., 2009). The same study found that African-Americans' heart failure rate is 20 times higher than that of whites before the age of 50 years old (Bibbins-Domingo, et al., 2009). A few of the greatest predictors of heart failure, and any other cardiovascular diseases for that matter, is diabetes, high blood pressure and being overweight. Almost every single participant of the survey distributed at Hebni has these risk factors. To prevent cardiovascular diseases like heart attacks or heart failure, the risk factors must be treated. As previously discussed, African-Americans often have less access to health care, opportunity or willingness to visit a doctor, participate in routine health screenings, or see a healthcare specialist.

Unfortunately, it is all too common for many individuals to see illness as the main reason for needing to go to the doctor; therefore they do not go for preventive care beforehand. The “go when you're sick” mentality is one way the prevention of chronic diseases slips through the cracks.

According to the American Diabetes Association (2018), nerve damage in the lower extremities (neuropathy), vision problems (retinopathy), kidney damage and skin complications are only a few of the issues that may develop from diabetes. Hypertension may quickly lead to cardiovascular diseases such as heart attack or stroke. Many participants of this survey reported already having possible secondary complications from their persisting chronic diseases. Reports of heart attacks, vision changes, and fatigue may all be secondary symptoms and repercussions to the larger issues (diabetes, hypertension) present. As the survey was being distributed to the participants at Hebni, the conversations about their diabetes was overheard. Many were unaware of how to control their diabetes and a Hebni worker was observed giving a few individuals glucose tabs and educating them on how to more properly manage their diabetes. It is unfortunate that these individuals have likely gone many years living with uncontrolled diabetes. This only reinforces the idea that free, public health education is desperately needed for individuals living in these types of situations. Hebni, and other organizations alike, even governments and other medical care facilities, have the ability to profoundly change an individual's life. There should be incentives for more organizations to become established and involved in the many populations and MUA's that desperately need the education, guidance, and support.

Finally, in an attempt to gain insight into the mind set and self-perception of those in the medically underserved population, the participants were asked to interpret their overall general health and satisfaction with their life. The majority, 65%, reported their health as being good, which is higher than the Florida average at 30%, according to the 2016 BRFSS survey. On the other hand, 10% of the participants reported their health as poor, which is a little higher than the Florida average of about 6% according to the 2016 BRFSS. Although the population size of the Hebni survey participants is small, it is reassuring to see that the individuals of the Orange County MUA perceive themselves to be fairly healthy. No matter the struggle an individual may be facing, a healthy mindset can make the world of a difference when battling an illness, and is often the first step to a healthy lifestyle. Following those positive statistics, 60% of individuals reported being very satisfied with their life, which would be expected with 65% perceiving their health as good, as the two usually go hand in hand. However, the high general health and life satisfaction reports by the participants are interesting, especially when considering that almost all participants of survey reported having at least one kind of series, potentially deadly chronic disease. Have these types of diseases become so mainstream within this population that individuals do not consider them to be out of the norm? So although many individuals reported having these chronic diseases (accompanied by many secondary symptoms such as vision changes and fatigue) do the participants consider that lifestyle to be inevitable, causing them not factor their diseases into their general health and life satisfaction responses? Likely, the answer to both those posed questions is “yes”. Many of these individuals have probably seen their siblings, parents, and even great grandparents contract and battle the same types of diseases they

are living with; perhaps, their perceptions are “this is just what happens”. Eventually, somehow, that cycle must be broken.

The purpose of this study was to investigate if certain health behaviors in the medically underserved population had any influence on particular health lifestyles or health statuses. This study also looked to determine if these health behaviors resulted in certain medical ailments being more prevalent or specific to this community. After analyzing the results of the survey there were only a couple reported health behaviors from the individuals living in MUAs that more dramatically varied from the norm of health behaviors of the general population. The most differentiated [from the norm] health statistic found from the Hebni survey participants was the incredibly high amount of reported diabetes and hypertension. Astonishingly, 81% of the participants claimed to suffer from diabetes which is around 66% higher than the FL average and about 70% higher than the national average, as reported by the 2016 BRFSS survey (Centers for Diseases Control and Prevention, 2016). Although the reports of diabetes was incredibly high, the possible associated symptoms report was not. This is most likely due to the participant’s unwillingness to answer all the questions and the limited number of questions in the survey. Furthermore, the rates of overweight and obesity of the participants is also very high. It was calculated and determined that every participant (100%) who provided their height and weight are either overweight or obese. This is much higher than the Florida average of about 36% of individuals who classify as overweight and about 28% of individuals who classify as obese, according to the 2016 reports from the BRFSS (Centers for Diseases Control and Prevention, 2016). Another differentiated [from the norm] health statistic found from the Hebni participants was the lack of physical activity and exercise routines. As stated before, only 15% of the survey

participants from Hebni reported exercising for the generally recommended time. This statistic is only 6% from the FL and national average and it is unclear whether this difference could be considered significant and specific to the MUA population surveyed. A larger sample population would help determine this. Lastly, although the hours slept at night and the consumption of fruits and vegetables did negatively vary from the recommended norms, the numbers are not deemed significant or specific to the MUA population. The small sample size of this study may have skewed these results.

To answer the primary question of this study, the researcher does not believe there are any glaring or *specific* health behaviors observed within this small sample of medically underserved individuals that may have had an influence on their health statuses. Nor is it believed that the health behaviors resulted in *certain* medical ailments to be more prevalent to this community. Although the very small sample number could have significantly skewed the results, it seems as though the health of individuals in the medically underserved community are affected by a number of elements, such as SES, social/societal factors, available resources, rather than a few specific behaviors or factors. The overall poorer health of individuals in the medically underserved community compared to the general population cannot solely be blamed on lack of exercise, poor nutrition, poor sleep habits, etc., but rather a culmination of all the factors. It is acknowledged that many of the health behaviors of the Hebni participants are slightly more negative than the general population. However, instead of trying to pinpoint specific negative behaviors, it is more likely that over time, the consistently poorer health habits of an individual in a MUA results in a more drastic decline in health towards the middle to later stages of life. Consistently lower [than average] levels of fruit and vegetable consumption may lead to vitamin

and nutrient deficiencies which may cause vision and digestive problems, along with an increased risk of cancers later in life (Lembo & Camilleri, 2003; Christen, Lui, Schaumberg, & Buring, 2005; Christen, Lui, Buring, & Schaumberg, 2008). Also, consistently lower than average physical activity and exercise levels may eventually lead to weight gain and many different types of chronic diseases, from cardiovascular to musculoskeletal to neurological (Booth, Roberts, & Laye, 2014). Finally, consistently poorer than average health habits such as like lack of sleep and increased alcohol consumption or smoking habits, in combination with poor diet and exercise routines, may all contribute to MUA individuals' overall lower than average health statuses as compared to the general population.

The secondary purpose of this study was to gain information that may help health care providers practicing in medically underserved communities to earlier identify risk factors in their patients and treat medical problems before they become more severe and expensive. As no one specific behavior was determined to be a risk factor that stands out, physicians must consider all possible factors. However, according to this study, lack of physical activity, inadequate sleep, and poor nutritional habits are some of the most prevalent risk factors among those in the medically underserved community. When seeing patients who live in MUAs, physicians and other health care practitioners should keep in mind that physical activity, nutrition, and sleep are cornerstone to a healthy individual. These factors should consistently be addressed as points of conversation and information, especially if the patient is a reoccurring visitor, so that patients are educated on these significant topics. So often physicians and other health care providers tend to only address the primary issue that patients present as the reason for coming to the clinic that day, In the case of medically underserved individuals, physicians should treat every interaction

as though they are doing a thorough physical exam. Reiterating the incredible importance of proper nutrition, physical activity, and sleep, and encouraging individuals to practice healthy lifestyle habits may eventually change the attitudes and behaviors of individuals living in MUAs.

Limitations

The greatest limitation of this research study was the very small number of participants. With only 20 surveys collected, each participant's answers carries a lot of weight. Due to this, outlying results have a greater ability to pull averages, which could greatly skew results. Furthermore, because this research study relied on self-reporting answers, participants are in total control of the answers provided. Participants may report the answers they think the researchers want to hear, rather than the actual truth. This also leads to skewed results. Basing research off of survey style questions limits the types and number of questions that can be asked. Too many questions causes participants to become bored and stop answering. Keeping questions concise and limited restricts the amount of data that can be collected. For example, when asking participants about income, it would have been enlightening to ask participants how many individuals are contributing to the monthly income and how many dependents the household is supporting. This would have given a better idea of the individual household and the individual's financial stability; but due to limited questions this was not addressed. Survey style questions also leaves room for participants to not answer questions. With only 20 total participants, missing data points and absent responses to particular prompts in the survey hurt data results and statistical analyses. Lastly, this research was only conducted at a single location, which limits data variety. Distributing this survey to many different locations among different MUA's would

provide more well-rounded and accurate data that might be more generalizable across MUA populations.

Future Research

This study would benefit from being conducted again with a greater number of participants. In addition, expanding to other areas throughout Florida, or the country would allow for a broader data set and a more concrete answer to the primary research question of determining if certain health behaviors in the medically underserved population had any influence on particular health statuses, and if those health behaviors are the cause for certain medical ailments to be more prevalent or specific to this community. Conducting this study at a free health clinic for the medically underserved would be a great way of gathering more relevant data. The study could also be adapted to explore the diet, physical activity, and self-reported health status between the genders. Exploring gender differences would aid in addressing the secondary purpose of this study and help health care professionals practicing in this community to earlier identify risk factors (more prevalent to males versus females) before a medical problem becomes more severe, difficult and expensive to treat. Expanding this research and recruiting other participants from other organizations would help give the results of this study more validity.

APPENDIX A: IRB LETTER OF APPROVAL



University of Central Florida Institutional Review Board
Office of Research & Commercialization
12201 Research Parkway, Suite 501
Orlando, Florida 32826-3246
Telephone: 407-823-2901 or 407-882-2276
www.research.ucf.edu/compliance/irb.html

Determination of Exempt Human Research

From: UCF Institutional Review Board #1
FWA00000351, IRB00001138

To: Anna Sarmiento Valdes and Kelley R Devoe

Date: February 28, 2018

Dear Researcher:

On 02/28/2018, the IRB reviewed the following activity as human participant research that is exempt from regulation:

Type of Review: Exempt Determination – Category 2 – Adult Participants
n=100

Project Title: Exploring Diet, Physical Activity, and Self-Reported
Health Status Among Men and Women in the Medically
Underserved Population.

Investigator: Anna Sarmiento Valdes

IRB Number: SBE-18-13864

Funding Agency:

Grant Title:

Research ID: N/A

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether these changes affect the exempt status of the human research, please contact the IRB. When you have completed your research, please submit a Study Closure request in iRIS so that IRB records will be accurate.

In the conduct of this research, you are responsible to follow the requirements of the [Investigator Manual](#).

This letter is signed by:

Signature applied by Jennifer Neal-Jimenez on 02/28/2018 10:00:12 AM EST

Designated Reviewer

APPENDIX B: SURVEY SAMPLE

1. Would you say that your general health is:
- a. Excellent
 - b. Good
 - c. Fair
 - d. Poor

2. How often do you eat fruits and/or vegetables (not including juice)?
- a. A few times a day
 - b. A few times a week
 - c. A few times a month
 - d. Never

3. Do you drink alcohol?
- a. Often
 - i. Number of drinks per day?

 - b. Sometimes / special occasion
 - c. No

4. Do you smoke?
- a. Yes
 - b. No

5. How many hours do you sleep at night?
- a. _____

6. Do you participate in regular physical activity/exercise (for example: running, walking, weight lifting, etc.)
- a. Yes
 - b. No

7. What type of physical activity/exercise do you do?
- _____

8. How many times a week do you do this physical activity/exercise?
- _____

9. How long do you do this physical activity/exercise? (minutes or hours)
- a. Less than 30 min
 - b. 30min – 60 min
 - c. 60+ minutes

10. How satisfied are you with your life?
- a. Very satisfied
 - b. Somewhat satisfied
 - c. Not satisfied

11. Select all of the following that apply to you:
- Heart attack
 - Diabetes
 - Asthma / lung disease
 - Musculoskeletal problems
 - Have high blood pressure (above 140/90 mmHG)
 - Other: _____

12. Select all of the following you have experienced in the past month?
- Reoccurring headaches
 - Reoccurring stomachaches (including diarrhea/constipation)
 - Cold / flu symptoms (fever, chills, sore throat, etc.)
 - Muscle / joint pains
 - Anxiety / nervousness
 - Allergies
 - Fatigue
 - Vision changes
 - Other: _____

Age: _____

- Sex:
- Male
 - Female

Height & Weight: _____

Ethnicity/Race: _____

Income (per month): _____

Highest Education:

- Less than high school
- High school degree
- Associates degree
- Bachelors degree
- Masters degree +

Occupation: _____

**APPENDIX C: HEBNI NUTRITION CONSULTANTS, LLC APPROVAL
LETTER**



HEBNI NUTRITION CONSULTANTS, INC.

2009 West Central Boulevard | Orlando, Florida 32805 | Telephone 407.872.1333 | Facsimile 407.872.7135

February 19, 2018

On behalf of Hebni Nutrition, I am granting Kelley Devoe, an undergraduate in the Honors in the Major Program at UCF, distribute her health behaviors survey to individuals attending our Project Oasis program.

Hebni's vision is to be recognized as the premier source of nutritional information that enables individuals to improve their health by driving changes in daily cooking and eating habits and increasing their knowledge of strategies to improving nutrition related diseases.

Sincerely,

Glen R. Providence
Director of Business Development
Hebni Nutrition Consultants, Inc.

REFERENCES

- Adler, N., Boyce, T., Chesney, M., Cohen, S., Folkman, S., Kahn, R., & Syme, L. (1994). Socioeconomic status and health: The challenge of the gradient. *American Psychologist*, 49(1), 15-24.
- American Diabetes Association. (2018). *Complications*. Retrieved from diabetes.org: <http://www.diabetes.org/living-with-diabetes/complications/>
- American Heart Association. (2017, December 14). *American Heart Association Recommendations for Physical Activity in Adults*. Retrieved from heart.org: http://www.heart.org/HEARTORG/HealthyLiving/PhysicalActivity/FitnessBasics/American-Heart-Association-Recommendations-for-Physical-Activity-in-Adults_UCM_307976_Article.jsp#.Wrq94Zch3IU
- American Psychological Association. (2018). *Ethnic and Racial Minorities & Socioeconomic Status*. Retrieved from apa.org: <http://www.apa.org/pi/ses/resources/publications/minorities.aspx>
- Baker, A., & Wardle, J. (2003). Sex differences in fruit and vegetable intake in older adults. *Appetite*, 40, 269-275.
- Barford, A., Dorling, D., Smith, G. D., & Shaw, M. (2006). Life expectancy: women now on top everywhere. *British Medical Journal*, 332(7545), 808.
- Besdine, R. W. (2016, September). *Physical Changes with Age*. Retrieved from Merck Manuals: <https://www.merckmanuals.com/professional/geriatrics/approach-to-the-geriatric-patient/physical-changes-with-aging>

- Bibbins-Domingo, K., Pletcher, M., Lin, F., Vittinghoff, E., Gardin, J. M., Arynchyn, A., . . . Hulley, S. (2009). Racial differences in incident heart failure among young adults. *The New England Journal of Medicine*, *360*, 1179-1190.
- Booth, F. W., Roberts, C. K., & Laye, M. J. (2014). Lack of exercise is a major cause of chronic diseases. *Comprehensive Physiology*, *2*(2), 1143-1211.
- Braveman, P. A., Cubbin, C., Egerter, S., Williams, D. R., & Pamuk, E. (2010). Socioeconomic disparities in health in the United States: What the patterns tell us. *American Journal of Public Health*, *100*(1), 186-196.
- Centers for Diseases Control and Prevention. (2016). *BRFSS Prevalence & Trends Data* . Retrieved from nccd.cdc.gov:
https://nccd.cdc.gov/BRFSSPrevalence/rdPage.aspx?rdReport=DPH_BRFSS.ExploreByTopic&irbLocationType=StatesAndMMSA&islClass=CLASS03&islTopic=TOPIC17&islYear=2016&rdRnd=54549
- Chaput, J.P. (2014). Sleep patterns, diet quality and energy balance. *Physiology and Behavior*, *134*, 86-91.
- Christen, W. G., Lui, S., Schaumberg, D. A., & Buring, J. E. (2005). Fruit and vegetable intake and the risk of cataract in women. *American Journal of Clinical Nutrition*, *81*(6), 1417-1422.
- Christen, W. G., Lui, S., Buring, J. E., & Schaumberg, D. A. (2008). Dietary carotenoids, vitamins C and E, and risk of cataract in women: a prospective study. *Arch Ophthalmol. American Journal of Clinical Nutrition*, *126*(1), 102-108.

- Courtenay, W. H., McCreary, D. R., & Merighi, J. R. (2002). Gender and ethnic differences in health beliefs and behaviors. *Journal of Health Psychology, 7*(3), 219-231.
- European Milk Forum. (2015). *Balanced diets play a major role in promoting health and preventing disease*. Retrieved from Milk, Nutritious by Nature: <http://www.milknutritiousbynature.eu/diet-nutrition-health/balanced-diets-play-a-major-role-in-promoting-health-and-preventing-disease/>
- Fagerli, R., & Wandel, M. (1999). Gender differences in opinions and practices with regard to a "healthy diet". *Appetite, 32*, 171-190.
- Farnsworth, J., Kim, Y., & Kang, M. (2015). Sleep disorders, physical activity, and sedentary behavior among US adults: National health and nutrition examination survey. *Journal of Physical Activity and Health, 12*, 1567-1575.
- Fiscella, K., Franks, P., Gold, M. R., & Clancy, C. M. (2008). Inequality in quality: Addressing socioeconomic, racial, and ethnic disparities in health care. *Journal of the American Medical Association, 579-584*.
- Giles-Corti, B., & Donovan, R. (2002). The relative influence of individual, social and physical environment determinants of physical activity. *Social Science & Medicine, 54*, 1793-1812.
- Harper, S., & Lynch, J. (2007). Trends in socioeconomic inequalities in adult health behaviors among US states, 1990-2004. *Public Health Reports, 122*, 177-189.
- Health Resources and Services Administration. (2016, October). *Medically Underserved Areas and Populations (MUA/Ps)*. Retrieved from Shortage Designation : <https://bhwh.hrsa.gov/shortage-designation/muap>

- Hemingway, H., Nicholson, A., & Marmot, M. (1997). The impact of socioeconomic status on health functioning as assessed by the SF-36 questionnaire: The Whitehall II study. *American Journal of Public Health, 87*(9), 1484-1490.
- Institute for Research on Poverty. (2016). *What are poverty thresholds and poverty guidelines?* Retrieved from irp.edu: <https://www.irp.wisc.edu/faqs/faq1.htm>
- Johansson, S.E., & Sundquist, J. (1997). Self-reported poor health and low educational level predictors for mortality: A population based follow up of 39,156 people in Sweden. *Journal of Epidemiology and Community Health, 51*, 35-40.
- Kavanagh, A., Goller, J., Jolley, D., King, T., Crawford, D., & Turrell, G. (2005). Urban area disadvantage and physical activity: A multilevel study in Melbourne, Australia. *Journal of Epidemiology and Community Health, 59*, 934-940.
- Kennedy, B., Kawachi, I., Glass, R., & Prothrow-Stith, D. (1998). Income distribution, socioeconomic status, and self-rated health in the United States: Multilevel analysis. *The British Medical Journal, 317*, 917-921.
- Lembo, A., & Camilleri, M. (2003). Chronic constipation. *The New England Journal of Medicine, 349*(14), 1360-1368.
- Leslie, E., & Cerin, E. (2008). How socio-economic status contributes to participation on leisure-time physical activity. *Social Science & Medicine, 66*, 2596-2609.
- Marshall, S., Jones, D., Ainsworth, B., Reis, J., Levy, S., & Macera, C. (2007). Race/Ethnicity, Social Class, and Leisure-Time Physical Inactivity. *Medicine & Science in Sports & Exercise, 39*(1), 44-51.

- National Sleep Foundation. (2018). *How Much Sleep Do We Really Need?* Retrieved from sleepfoundation.org: <https://sleepfoundation.org/excessivesleepiness/content/how-much-sleep-do-we-really-need-0>
- Oers, J. A., Bongers, I. M., Van de Goor, L. A., & Garretsen, H. F. (1999). Alcohol consumption, alcohol-related problems, problem drinking, and socioeconomic status. *Alcohol*, 34(1), 78-88.
- Pampel, F. C., Krueger, P. M., & Denney, J. T. (2010). Socioeconomic disparities in health behaviors. *Annual Review of Sociology*, 36, 349-370.
- Patel, S., Malhorta, A., White, D., Gottlieb, D., & Hu, F. (2006). Associations between reduced sleep and weight gain in woman. *American Journal of Epidemiology*, 164(10), 947-954.
- Pincus, T., Callahan, F., & Burkhauser, V. (1987). Most chronic diseases are reported more frequently by individuals with fewer than 12 years of formal education in the age 18-64 United States population. *Journal of Chronic Diseases*, 40(9), 865-74.
- Plotnikoff, R., Mayhew, A., Birkett, N., Louciades, C., & Fodor, G. (2004). Age, gender, and urban-rural differences in the correlates of physical activity. *Preventive Medicine*, 39, 1115-1125.
- Poortinga, W. (2007). Associations of physical activity with smoking and alcohol consumption: A sport or occupation effect? *Preventive Medicine*, 45, 66-70.
- Roos, E., Lahelma, E., Virtanen, M., Prattala, R., & Pietinen, P. (1998). Gender, socioeconomic status and family status as determinants of food behavior. *Social Science & Medicine*, 46(12), 1519-1529.

- Rugel, E. J., & Carpiano, R. M. (2015). Gender differences in the roles for social support and ensuring adequate fruit and vegetable consumption among older adult Canadians. *Appetite, 92*, 102-109.
- Sallis, J. (1992). Predictors of adoption and maintenance of vigorous activity in men and woman. *Preventive Medicine, 21*(2), 237-251.
- Savage, J. S., Fischer, J. O., & Birch, L. L. (2007). Parental influence on eating behavior: Conception to adolescence. *Journal of Law Med Ethics, 35*(1), 22-34.
- Seefeldt, V., Malina, R., & Clark, M. (2002). Factors affecting levels of physical activity in adults. *Sports Medicine, 32*(3), 143-168.
- Sieverding, M. (2002). Gender and health related attitudes: The Role of a "macho" self-concept . *Gender and Health Related Attitudes, 237-250*.
- Silberstein, L. R., Striegel-Moore, R. H., Rodin, J., & Timko, C. (1988). Behavioral and psychological implications of body dissatisfaction: Do men and women differ? *Sex Roles, 19*(4), 219-232.
- Steenland, K., Hu, S., & Walker, J. (2004). All-cause and cause-specific mortality by socioeconomic status among employed persons in 27 US states, 1984–1997. *American Journal of Public Health, 94*(6), 1037-1042.
- U.S Department of Health and Human Services. (2017, April). *Medically Underserved Areas/Populations*. Retrieved from Health Resources & Services Administration Data Warehouse:
https://ersrs.hrsa.gov/ReportServer/?/HGDW_Reports/BCD_MUA/BCD_MUA_State_Statistics_HTML&rc:Toolbar=false

United States Census Bureau. (20126). *Quick Facts - Florida*. Retrieved from census.gov:

<https://www.census.gov/quickfacts/FL>

US Department of Health and Human Services. (2018). *Shortage Areas*. Retrieved from HRSA

Data Warehouse: <https://datawarehouse.hrsa.gov/topics/shortageAreas.aspx>

White, I., Altmann, D., & Nanchahal, K. (2002). Alcohol consumption and mortality: modeling risks for men and women at different ages. *British Medical Journal (Clinical Research Ed.)*, 235:191.

Williams , D. R., Mohammed , S. A., Leavell, J., & Collins, C. (2010). Race, socioeconomic status and health: Complexities, ongoing challenges and research opportunities. *Annals of the New York Academy of Sciences*, 69-101.

Winkleby, M., Jatulis, D., Frank, E., & Fortmann, S. (1992). Socioeconomic status and health: How education, income, and occupation contribute to risk factors for cardiovascular disease. *American Journal of Public Health*, 82(6), 816-820.