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**Assessment on Hispanics Educational Attainment  
In Relation to Food Insecure Households in California**

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### **Abstract**

In the United States, Health disparities exist among all populations or ethnic groups. Hispanics have been reported to have higher health disparities and lower levels of educational attainment. Currently, there is little or no published research specifically on food insecurity among Hispanics in relation to their educational attainment. The specific aim of this study is to investigate the relationship between educational attainment and food insecurity that exist among Hispanic families. In this study, we assessed Hispanics' educational attainment and its relationship to food insecure Hispanic households in California. This study analyzed secondary data from the 2016 California Health Interview Survey (CHIS) by measuring specific variables related to Hispanics' educational attainment and household food insecurity. Using one-way Analysis of Variance (ANOVA), the data were analyzed to compare the different levels of educational attainment and level of food insecurity. The results showed a statistical significance between Hispanic adults' educational attainment and food insecurity. Those with the lowest level of education showed higher incidence of food insecurity. The findings suggest that household food security in Hispanic households was directly linked to the level of education attained by those who participated in this study.

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**List of Tables**

Table 1: Hispanic Adult Demographics (2016 CHIS).....	21
Table 2: Educational Attainment Levels (2016 CHIS).....	22
Table 3: Survey Questions Concerning Food Insecurity (2016 CHIS).....	24
Table 4: Skipping Meals for Money (In Past 12 Months) (2016 CHIS).....	25
Table 5: Food Insecurity Levels (2016 CHIS).....	25
Table 6: Analysis of Variance (One-Way)	
Educational Attainment and Food Insecurity (2016 CHIS).....	27

**Table of Contents**

Abstract.....	2
Acknowledgments .....	3
List of Tables .....	4
Introduction.....	7
<i>Literature Review</i> .....	7
Study Overview .....	15
<i>Hypotheses</i> .....	16
Methods .....	16
<i>Study Overview and Design</i> .....	16
<i>Selection of Participants</i> .....	17
<i>Data Collection</i> .....	18
<i>Data Analysis</i> .....	19
Results.....	20
<i>Statistical Analysis</i> .....	20
<i>Hispanics Demographics From the CHIS Database</i> .....	20
<i>Educational Attainment</i> .....	21
<i>Food Insecurity</i> .....	22
<i>Educational Attainment and Food Insecurity</i> .....	25
Discussion.....	28
<i>Strengths</i> .....	29
<i>Limitations</i> .....	29
Conclusion .....	31

References..... 32

## **Introduction**

Health disparities exist among all populations and ethnic groups; however, Hispanics are reportedly faced with significant health disparities and serious health consequences when compared to other groups in the United States (United States Census Bureau, 2017). The United States Census Bureau (USCB) population of Hispanics has steadily increased during the past decade and is predicted to become a majority group during the coming years (2017).

Available data showed that Hispanics generally have lower levels of educational attainment when compared to the other ethnic groups (National Center for Campus Public Safety, 2015). One of the leading indicators for health disparities among the Hispanics is food insecurity. The United States Department of Agriculture (USDA) reported that in 2014, 22.4% of Hispanic households in the U.S. were food insecure (USDA, 2018).

According to Healthy People 2020 (2018), the goal for health disparities should be achieved through health equity, the elimination of health disparities, and overall improvement in the health of all groups. Healthy People 2020 (2018) will seek to reach health equity by encouraging collaborations across different communities and sectors, empowering individuals to make more informed health decisions, and measure the impact of all prevention activities. The vision that Healthy People 2020 (2018) has for the nation is a society in which all people live long and healthy lives.

## **Literature Review**

The United States Office of Management and Budget (OMB) defines the term “Hispanic” as a person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin regardless of their race (USCB, 2018). The United States Census is conducted every ten years. In the 2010 Census, the question regarding Hispanic origin had five different options to choose from including “Mexican, Mexican-American, Chicano” or “Puerto Rican” or

“Cuban”, and “another Hispanic, Latino, or Spanish origin” (USCB, 2018). In general, individuals who categorize themselves as Hispanic are not strictly restricted to being born or coming from these specific backgrounds, and do include anyone who self identifies as Hispanic.

As of July 2016, it was reported that Hispanics in the United States were the nation’s largest ethnic minority group with approximately 57.5 million or 17.8% of the population (USCB, 2017). It is projected that by the year 2060, the Hispanic population will grow to approximately 119 million people, thus perpetuating it as the largest minority group within the United States. This projection of Hispanics will make up approximately 28.6 percent of the entire nation and invariably a majority group (USCB, 2018). In more recent research, Hispanics make up 17.8 percent of the nation’s total population within the year 2017 (USCB, 2017).

A recent report by the Pew Research Center indicated that Mexican-origin Hispanics, meaning those individuals who were born in Mexico and migrated to the United States, have always remained as the largest of this ethnic group (Pew Research Center, 2017). Additionally, dating as far back to 1860, it was reported that approximately 155,000 Hispanics lived in the United States (Pew Research Center, 2017). Of that population, 81% were of Mexican-origin, recorded as history’s highest migrated country of origin group within the United States (Pew Research Center, 2017). The Pew Research Center also reported that within one year from July 2015 to July 2016, the population of Hispanics grew by a total of 1,131,700 individuals (Pew Research Center, 2017).

In 2016, it was reported that nine states within the United States had at least one million or more Hispanic residence (Pew Research Center, 2017). The United States Census Bureau reported that in 2016 out of all fifty states, California reported having the largest Hispanic population with a total of 15.3 million individuals residing there (USCB, 2018). The California

Senate Office of Research reported that compared to non-Latino populations, California's Latino population has grown the fastest and most consistently. The California Department of Finance (DOF) estimated that California's population will consist of 43% and 49% of Latinos by the year 2030 and 2060 respectively (USCB, 2018). The Hispanic population is not only a growing group throughout the United States, but is also a significantly growing population in California.

A 2016 report on educational attainment in the United States showed that the majority of adults (or 88% of the population) had at earned at least a high school diploma (USCB, 2017). In addition, 66.7% of Hispanics were high school graduates (USCB, 2017). The United States Census Bureau defines educational attainment as:

“Educational attainment refers to the highest level of education that an individual has completed. This is distinct from the level of schooling that an individual is attending, meaning that this only includes level of schooling that an individual has fully completed” (USCB, 2018).

The National Center for Campus Public Safety reported that Hispanics had lower levels of educational attainment when compared to other ethnic groups in the United States (2015). In 2013, 22% of Hispanic adults were reported to have earned their received an associate degree or higher (2015).

Educational attainment has a direct effect on income and socioeconomic status. It is a major factor that can define the status of any household's nutrition and a contributing factor to food insecurity among Hispanics (Pew Research Center, 2017). The level of education completed an individual is a major contributing factor to populations demographics and characteristics that can potentially lead to serious health disparities (Pew Research Center, 2017).

The United States Census Bureau reports that Hispanics have the lowest percentage of educational completion among every level from high school to institutions of higher education and advanced degrees (2016). Dating back to 1988, both Hispanics and Blacks have been ranked among the lowest ethnic groups for attaining a bachelors' degree or higher (USCB, 2016). The United States Census Bureau reported that in 2013, educational attainment among the Hispanic population ranked lowest at 22% when compared to other ethnic groups such as Asians (60%), Whites (46%), and African Americans (31%) (USCB, 2016). However, education attainment among Hispanics in the United States has evolved over the past few years and between 2004 and 2013, Hispanics who earned an associate degree or higher grew from 3.8 million to 6.5 million graduates, a 71% increase within a nine-year period (USCB, 2016).

Excelencia (Excellence) in Education, a social support program aiding Latino and Hispanic students achieving their highest educational attainment, reported that over the past ten years, educational attainment among Hispanics has grown (2015).

A study conducted by Harsimran Singh et al. (2017) on influencing higher education among disadvantaged Hispanic high school students reported that Hispanics have the lowest education attainment level out of all the other ethnic groups within the United States. Although, the percentage of young Hispanics enrolled in higher education has slightly increased over the past few years at 32% this group remains the lowest among those enrolled in higher education when compared to African Americans at 38% and Asians at 62% (Singh et al., 2017). Among the 32% of young Hispanics enrolled in college or any other higher education, only 13% successfully completed and earned a college degree (Singh et al., 2017).

According to the California Department of Education (2018), Hispanics represented 54% of total enrollment in California public schools during the 2017-2018 academic school year

including elementary, (grades K-5), middle (grades 6-8) and high schools (grades 9-12). The California Senate Office of Research (2014) reported that between 2006 and 2010, Latinos 25 years and older were more likely to drop out of high school and ultimately failed to earn their high school diplomas when compared to other ethnicities in the same age group. Specifically, only 57% of Hispanics had acquired their high school diplomas during this time frame, when compared to the nation (California Senate Office of Research, 2014). Additionally, only one in ten Latinos reported earning a bachelor's degree. In 2010, only 38% of 19 million of Latinos between the ages of 18-24 years in California were enrolled in public higher education (California Senate Office of Research, 2014). A breakdown showed that 31% were enrolled in community colleges, 5% were enrolled in the California State University (CSU) system, and 2% were enrolled in the University of California (UC) system (2014).

Educational attainment has been shown to be associated with food insecurity. The US Bureau of Labor Statistics (2018) stated that among all adults 25 years and older who earned full time wages, the average median weekly salary was \$488 with no high school diploma, \$668 with a high school diploma, and \$1,193 with a bachelors' degree. Considering the low median weekly salaries without or without a high school diploma, available data has shown that education attainment is a contributing factor to food insecurity among Hispanics households. The United States Department of Agriculture (2018) reported that depending on the ages of the children living in the household, the cost of feeding a healthy diet to a family of four ranged between \$129 and \$1,283. The greatest predictor of health disparities is associated with socioeconomic status (SES), regardless of ethnic/cultural/racial identity (citation needed here, Erica, so please look it up), and these are factors associated with how Hispanics fit in the U.S. socioeconomic stratum.

Food insecurity is a leading problem within the United States and in 2016, approximately 12.3% of all United States households were food insecure at least once during the year (USDA, 2018). The USDA defines food insecurity as:

“Food insecurity is a condition assessed in the food security survey and represented in USDA food security reports in which a household-level economic and social condition of limited or uncertain access to adequate food. Low food security reports of reduced quality, variety, or desirability of diet with little to no indication of reduced food intake while very low food security reports of multiple indications of disrupted eating patterns and reduced food intake” (USDA, 2018).

There was a decrease in food insecure households between the years 2015 and 2016, however, food insecure households only dropped from 5.0 percent to 4.9 percent (USDA, 2018). This relates to historical trends because although there is a problem with food insecurity nation wide, there has recently been an increase in the percentage down fall of food insecurity nationwide.

Food insecurity has been a nationwide problem for many years and remains one of the leading health disparities among the Hispanics (Pew Research Center, 2017). The USDA stated that 22.4% of Hispanic households living in the United States were food insecure in 2014, a number that is higher than the national average of 14% (USDA, 2018). In more recent research reported by the USDA, an estimated 88.2% of U.S. households were food secure in 2017 while the remaining 11.8% were food insecure (Alisha Coleman-Jensen, 2018).

A recent study by Walsemann et al. (2017) reported that between the years 2000 and 2007, food insecurity ranged between 10.5% and 12% nationwide and had a significant increase of 15% between 2008 and 2011. Nationwide survey data on food insecurity collected between 2014 and 2016 by the USDA ranged from 8.7 percent in Hawaii to 18.7 percent in Mississippi

(Walsemann et al., 2017). In addition, the USDA data estimated very low food security prevalence that ranged from three percent in Hawaii and Delaware to 7.7 percent in Alabama and Louisiana (Walsemann et al., 2017).

In 2014, Hispanics represented 6.9% of total United States households and remains the leading group with severe food insecurity of when compared to the average of 5.6% for the other ethnic groups (USDA, 2018). The 2011-2012 California Health Interview Survey (CHIS) stated that members of a food insecure household were more at risk for experiencing disrupted eating patterns and that food insecurity was more prevalent among Hispanic households compared to non-Hispanic whites (Walsemann et al., 2017).

A recent study by Irma Arteaga et al. (2017) that compared food insecurity among United States-born and foreign-born Hispanics between 1998 and 2011 showed that social changes strictly targeting Hispanics had very strong adverse effects or risks for food insecurity. These risks are related to ongoing government changes and existing restrictions on immigrants' access to government-provided resources such as public social support programs and the ability to obtain driver's license. It is important to consider immigrants in this specific study because the CHIS study does not ask about individual legal status. Including immigrants in this study is important because California is a close border to Mexico. It must be noted that important social support programs such as Women Infants and Children (WIC), CalFresh, and Temporary Assistance for Needy Families (TANF), were designed to provide nutritious food to those in need and invariably minimize food insecurity (USDA, 2018). Also, the inability to obtain a driver's license has a strong limitation to transportation services and a household's access to nutritious foods and invariably leads to increasing food insecurity among Hispanic population.

In a study conducted by Hernandez et al. (2017), on food insecurity and adult obesity combined with gender and ethnic disparities, it was shown that food insecurity was more dominant among Hispanics and is associated with non-critical and critical health issues. Hernandez et al. (2017) noted that approximately 13% of adults in the United States experience food insecurity with substantial disparities targeting women and Hispanic households who were at higher risks of being overweight or diabetic (Hernandez et al., 2017).

A similar study by Smith et al. (2016) explored the relationship between household food insecurity and obesity among low-income Hispanic subgroups as a determinant for overweight and obesity. Smith et al. (2016) stated that approximately 78% of Hispanics in the United States were overweight or obese. Furthermore, the study noted that the Hispanics as a group is multi-ethnic hence the possibility of food insecurity and obesity was not consistent across various subgroups of Hispanics and their countries of origin. The above-referenced cross-sectional study by Smith et al. (2016) showed a significant association between overweight and obesity and household food insecurity among low-income Mexican-American females. There was no significant association between household food insecurity and overweight or obesity among Mexican-American males or Non-Mexican-American subgroups (Smith et al., 2016). The authors concluded that a behavior difference could account for the observed outcome on obesity and household food insecurity among Hispanic subgroups.

It is important to also consider how food desserts can be a contributing factor to Hispanics food insecurity. The USDA defines a food dessert as:

“Part of the country vapid of fresh fruit, vegetables, and other healthful whole foods, usually found in impoverished areas. This is largely due to a lack of grocery stores, farmers’ markets, and healthy food providers” (USDA, 2018).

The USDA reports that in the majority of California within the year 2016, there was not enough data on how many households had no car and no grocery store within a mile (USDA, 2018).

### **Study Overview**

The goal of this study was to gain a better understand of the effects that educational attainment has on food insecurity, specifically among Hispanic adults living in California. Additionally, the study explored existing and available programs designed to assist and alleviate food insecurity among the affected households. This observational study design relies on secondary data collected from the 2016 California Health Interview Survey (CHIS). Data on Hispanics included in this study is based on self-reported demographic variables, including race and ethnicity. Food insecurity is defined by one specific variable as documented on the CHIS survey. Educational attainment is defined by combining eight variables included in the CHIS survey.

The purpose of this project is to assess the relationship between educational attainment and food insecurity among Hispanic households. This study will seek out to assess Hispanics education attainment in California, specifically 2016, and its effects on food insecure households.

Currently, there is little or no published research specifically on food insecurity levels among Hispanics in relation to their educational attainment. The specific aim of this study is to investigate the relationship between educational attainment and food insecurity that exist among Hispanic families. The specific aims of this project include the following:

Specific Aim 1: To examine the association between education attainment and food insecurity among Hispanics in California.

Specific Aim 2: To examine the differences between food insecurities and the level of educational attainment (i.e., no high school diploma, high school diploma, and completion of other higher education).

### **Hypotheses**

Hypothesis 1: There is a direct link between lower level of educational attainment among Hispanic adults and food insecurity.

Hypothesis 2: Hispanic adults who have a high school diploma or higher will be less likely to live in a food insecure household.

## **Methods**

### **Study Overview and Design**

The purpose of this project was to explore educational attainment among Hispanics in California and its effects on food insecure households. Educational attainment is often viewed as a sensitive topic to discuss and can possibly bring embarrassment to the highest level completed. It may bring embarrassment for someone to admit their true educational attainment or may want to please the researcher and give them an answer they think the researcher would want to hear. Specifically, when analyzing educational attainment by Hispanics, cultural barriers should be considered as a contributing factor. Some cultural barriers can include the stereotype of Hispanics not completing higher education. Specifically there is a stereotype that Hispanic females are less likely to complete higher education compared to their male counterparts. Another cultural barrier are the financial responsibilities that come with pursuing a higher education. Not all students may qualify for grants and scholarships.

This study is an observational design based on secondary data analysis from the 2016 California Health Interview Survey (CHIS). CHIS is reported to be the largest state health survey

in the nation and is housed at the University of California Los Angeles (UCLA) Center for Health Policy Research (UCLA Center for Health Policy, 2018). CHIS is a random-dial telephone survey conducted continuously every year on numerous ranges of health topics (e.g., mental health, health behaviors, women's health, dental health, neighborhood and housing, and food environment). CHIS is primarily funded through both private and public partnership agreements by organizations that have goals and visions of improving the overall health of Californians (UCLA Center for Health Policy, 2018). In addition, CHIS data represents all 58 counties in California and is distributed through a continuous cycle for annual review of data estimates. By running continuous one-year data estimates, CHIS provides opportunities for researchers to analyze and understand the social determinants and distributions of factors that affect the health of Californians (2018). Local health departments, community organizations, and researchers rely on this valuable and informative data (2018). In return, CHIS data provides information on current health and healthcare needs within California with a view to creating lasting solutions.

### **Selection of Participants**

The selection process for the participants was in accordance with a very carefully defined 2016 CHIS criteria for adult surveys. All participants representing all races and/or ethnicities in California were randomly chosen. Using telephone numbers that were randomly drawn through computers. Participation was optional and individuals could withdraw if they chose not to be a part of it. CHIS conducts separate surveys for children (birth through 11 years old), adolescents (ages 12 through 17), and adults ages 18 and over). This project will focus on examining the 2016 CHIS adult survey. One adult was selected from each household. This project will focus on examining the 2016 CHIS adult survey that involved Hispanics-only adults who were 18 years and older. After creating a Hispanic adult variable, educational attainment variable and food

insecurity variable, there were a total of 21,055 Hispanic adults in the 2016 CHIS data set. The descriptions and classifications for the different variables used, dependent and independent will be further discussed in detail in the following section.

### **Data Collection**

#### **Independent Variable 1: Hispanic Adults**

In this study, an attempt was made to create a variable pertaining to Hispanic adults by describing and analyzing specific questions obtained from the 2016 CHIS adult questionnaires. The questions included the following self-reported variables: age; gender; and Latino and Hispanic subtypes (based on two different levels). All of these variables will be grouped together in order to create a variable for Hispanic adults.

#### **Independent Variable 2: Educational Attainment**

In order to see if there was an association between Hispanics and food insecurity, educational attainment was examined. The CHIS survey questions that will be used to evaluate educational attainment enquired about the highest level of education completed. Including: no formal education or Grades 1-8; Grades 9-11; Grades 12 or high school diploma; some college; vocational school; AA or AS degree; BA or BS degree or some graduate school; MA or MS degree, and Ph.D. or equivalent.

#### **Dependent Variable: Food Insecurity**

This study will employ demographic questions pulled from the 2016 adult CHIS questionnaire in order to create a variable labeled "food insecurity". Food insecurity will be measured using specific questions adapted from the 2016 CHIS adult questionnaires and will include the following: During the past 12 months

- a. How often were you unable to afford food (go hungry) or had insufficient food?
- b. How often were you unable to eat balanced meals?

- c. How many adults in your household skipped any meals?
- d. How often did your household eat less food than you should have?
- e. What is the food security status for your household?

The food insecurity variable will include for all adults 22 years and older for both genders, as defined in the CHIS questionnaires.

### **Data Analysis**

The data was analyzed using the Social Package for the Social Sciences (SPSS).

Hispanics adults (IV1) will be separated into two categorical variables, which will include gender (male or female) and race (Hispanic and Latino). IV1 will be created into its own variable in SPSS by utilizing certain questions based off the CHIS questionnaire. Educational attainment (IV2) will be separated into an ordinal variable based off of education level (No formal education or grade 1-8; grade 9-11; grade 12 or H.S. diploma; some college; AA/AS degree or vocational school; BA or BS degree or some graduate school; MA or MS degree and PH.D. or equivalent). Food insecurity (DV) is a categorical variable in which an adult will either be food insecure or food secure. Due to the mean differences between the two independent variable groups, a one-way ANOVA will be conducted in order to measure the association between the two independent variables (Hispanic adults and educational attainment) and the dependent variable (food insecurity). A one-way analysis of variance also known as a one-way ANOVA is used to determine whether there are any statistically significant differences between the means of two or more independent variables (Gertsman, 2015).

## **Results**

### **Statistical Analysis**

The purpose of this project was to explore educational attainment among Hispanics in California and its effects on food insecure households. The data was retrieved from the 2016 California Health Interview Survey (CHIS) adult questionnaire. All of the participants were aware that this was a voluntary survey and they could choose to stop participating at any point in time during the survey. Variables were computed in order to create individual variables for Hispanics, Food Insecurity, and Educational Attainment based off the self-reported questionnaires. Frequencies were analyzed in order to receive participant's demographics. An Analysis of Variance (ANOVA) was computed to see any relation between Hispanics educational attainment and food insecurity. All of the data was analyzed through the software program SPSS.

### **Hispanics Demographics From the CHIS Database**

Based on the 2016 CHIS adult questionnaire, there were a total of 21,055 Hispanic adult participants, which consisted of 9,307 males and 11,748 females. All of the 21,055 participants were included in this particular study regarding food security levels in relation to educational attainment. Table 1 contains some of the participant's demographic information including the total amount of participants, gender and ages which is branched off into age groups. The ages of all 21,055 Hispanic adults ranged between 18 years old through 85 and older. The leading age group that participated in the 2016 CHIS survey was 65-69 year olds (n=2,442) while the smallest age group that participated in the 2016 CHIS survey was 26-29 year olds (n=804).

Table 1: Hispanic Adult Demographics (2016 CHIS)

Variable(s)	Total	Percentage (%)
Gender		
Male	9,307	44.2
Female	11,748	55.8
Total	21,055	100
Age Categories (Years)		
18-25	1,998	9.49
26-29	804	3.82
30-34	1,087	5.16
35-39	1,058	5.02
40-44	1,156	5.49
45-49	1,286	6.11
50-54	1,753	8.33
55-59	1,935	9.19
60-64	2,207	10.5
65-69	2,442	11.6
70-74	1,833	8.71
75-79	1,425	6.77
80-84	1,093	5.19
85+	978	4.64
Total	21,055	100

### **Educational Attainment**

Among all the 21,055 Hispanic adult participants in the 2016 CHIS, educational attainment was divided into nine different categories. The nine categories include: no formal education or grades 1-8; grades 9-11, grade 12 or high school diploma; some college; vocational school; AA or AS degree; BA or BS degree or some graduate school; MA or MS degree; and Ph.D. or equivalent. Table 2 displays educational attainment of all the participants. The leading educational attainment achieved among Hispanic adults is a BA or BS degree or some graduate school (n=4,992). Educational attainment of grade 12 or a high school diploma (n=4,919) was in close proximity with only 73 less participants achieving that education completion. The educational attainment level with the least amount was vocational school (n=524).

Table 2: Educational Attainment Levels (2016 CHIS)

Variable(s)	Total	Percentage (%)
Educational Attainment		
No formal education or Grades 1-8	1,421	6.7
Grades 9-11	1,044	5.0
Grade 12 or H.S. Diploma	4,919	23.4
Some College	3,093	14.7
Vocational School	524	2.5
Associates Degree	1,736	8.2
Baccalaureate Degree/Some Graduate School	4,992	23.7
Masters Degree	2,452	11.6
Ph.D. or <sup>1</sup> Equivalent	874	4.2
Total	21,055	100

### Food Insecurity

There were several questions regarding food insecurity in the 2016 CHIS questionnaire. Table 3 displays all the questions that concern affording food, consuming less food due to a lack of finances or in order to save money, and going hungry due to a lack of finances or in order to save money. The questions regarding how often food did not last or could not afford more food in the past 12 months showed the following: skipped (n=139); inapplicable (n=13,563); often true (n=867); sometimes true (n=2,266); and never true (n=4,220). How often couldn't afford to eat balanced meals resulted in: skipped (n=139); inapplicable (n=13,563); often true (n=913); sometimes true (n=2,325); and never true (n=4,115). The question regarding all adults cutting or skipping meals for money within the past 12 months resulted in: inapplicable (n=13,645); option

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<sup>1</sup> Equivalent: CHIS defines equivalent as someone acquiring their educational attainment through either medical or law school.

yes (n=1,762); and option no (n=5,648). The question asking whether an adult ate less than they should have because of money within the past 12 months displayed: skipped (n=139 or 0.006%); inapplicable (n=12,563); option yes (n=1,871); and option no (n=5,482). Survey question regarding how often an adult went hungry but did not eat because of money within the past 12 months resulted in: skipped (n=139); inapplicable (n=13,563); option yes (n=1,250); and option no (n=6,103).

Table 4 displays how often adults cut or skipped meals due to a lack of finances. This question was measured based upon different time frames. The question specifically asked participants how often adults cut or skipped meals in the past 12 months for money in which participants resulted in: inapplicable (n=19,293); almost every month (n=645); some months but not every month (n=606); and only within one to two months (n=511).

Table 5 displays food security status levels. There is a food security status level with one level and a food security status with two levels. Food security status level with one level involves four options for participants to choose from which consisted of: inapplicable (n=13,723); food security (n=4,307); food insecurity without hunger (n=1,886); and food insecurity with hunger (n=1,139). Food security with two levels also gave participants three options to choose from which included: inapplicable (n=13,723); food security (n=4,307); and food insecurity with or without hunger (n=3,025).

Table 3: Survey Questions Concerning Food Insecurity (2016 CHIS)

Variable(s)	<sup>2</sup> Proxy Skipped	<sup>3</sup> Inapplicable	Often True	Sometimes True	Never True	Yes	No	TOTAL
How often food didn't last, couldn't afford more (In the Past 12 Months)	139	13,563	867	2,266	4,220	N/A	N/A	21,055
How often couldn't afford to eat balanced meals	139	13,563	913	2,325	4,115	N/A	N/A	21,055
All adults cut/skipped meals for money (In the Past 12 Months)	N/A	13,645	N/A	N/A	N/A	1,762	5,648	21,055
Ate less than should of because of money (In the Past 12 Months)	139	12,563	N/A	N/A	N/A	1,871	5,482	21,055
How often hungry but didn't eat because of money (In the Past 12 Months)	139	13,563	N/A	N/A	N/A	1,250	6,103	21,055

<sup>2</sup> Proxy skipped: CHIS participants who chose to skip that specific survey question.

<sup>3</sup> Inapplicable: CHIS participants in which a specific survey question did not apply to them.

Table 4: Skipping Meals for Money (In Past 12 Months) (2016 CHIS)

Variable(s)	Inapplicable	Almost Every Month	Some Months But Not Every Month	Only In 1 Or 2 Months	Total
Food Insecurity Question					
How Often All Adults Cut/Skipped Meals in the Past 12 Months for Money	19,293	645	606	511	21,055

Table 5: Food Insecurity Levels (2016 CHIS)

Variable(s)	Inapplicable	Food Security	Food Insecurity Without Hunger	Food Insecurity With Hunger	Food Insecurity With/Without Hunger	Total
Food Insecurity Levels						
Food Security Status Level <sup>4</sup>	13,723	4,307	1,886	1,139	N/A	21,055
Food Security Status (2 Levels) <sup>5</sup>	13,723	4,307	N/A	N/A	3,025	21,055

**Educational Attainment and Food Insecurity**

An Analysis of Variance (ANOVA) was conducted through SPSS in order to test the relation between Hispanics educational attainment and food insecurity. According to Burt Gertsman, an ANOVA is defined as a collection of statistical models in order to analyze any

<sup>4</sup> Status level: Includes four options for participants to choose from, which consisted of inapplicable, food security, food insecurity, and food insecurity without hunger.

<sup>5</sup> Status (2 Levels): Includes three options for participants to choose from, which consisted of inapplicable, food security, and food insecurity with or without hunger.

possible variations between groups (Gertsman, 2015). For this specific study a One-way ANOVA was conducted. Table 6 displays Hispanics educational attainment in relation to food insecurity based on a One-Way ANOVA. In this particular study the groups being analyzed are Hispanic adults, educational attainment, and food insecurity. The variables used in this ANOVA were computed in SPSS and were computed based off of the survey questions that were listed in the above tables from the CHIS survey questionnaire. The computed variables were titled food insecurity (ordinal), Hispanics (nominal), and educational attainment (ordinal). The factor was Hispanic adults while the dependent list included food insecurity and educational attainment.

Both the food insecurity and educational attainment groups had a sample size of 21,055. The mean or average was provided for food insecurity (-.7214) and educational attainment (5.0392). Standard deviation or amount of variation resulted in the following for food insecurity (10.00072), which was greater than educational attainment (2.31286).

P-values tell whether there is any difference between groups being studied or if there was or was not any type of statistical significance (Gertsman, 2015). The P-value or significance for food insecurity among Hispanic adults educational attainment was found to be statistically significant ( $p < .001$ ). The study showed there was a link between the dependent variable (food insecurity) and independent variable 1 (Hispanic adults) and independent variable 2 (Educational attainment). Hispanic adults educational attainment does have a direct correlation to food insecurity.

Table 6: Analysis of Variance (One-Way) Educational Attainment and Food Insecurity (2016 CHIS)

Summary			
Groups	Sample Size	Mean	Std. Deviation
Food Insecurity	21,055	-.7214	10.00072
Educational Attainment	21,055	5.0392	2.31286

ANOVA					
Source of Variation	Sum of Squares	df	Mean of Square	F	Sig.
Food Insecurity					
Between Groups	177804.342	55	3232.806	35.212	.000
Within Groups	1927899.369	2099	91.809		
Total	2105703.711	21054			
Educational Attainment					
Between Groups	13844.633	55	251.721	53.512	.000
Within Groups	98780.041	20999	4.704		
Total	112624.674	21054			

### **Discussion**

Participant's responses were collected from the 2016 California Health Interview Survey (CHIS). After conducting a One-Way ANOVA it was found that there was statistical significance between Hispanic adults educational attainment in relation to food insecurity. Specifically, it was found that adults who did not complete any type of education were more likely to live in a food insecure household compared to those Hispanic adults who did attain some sort of educational attainment.

It was hypothesized that lower educational attainment levels among Hispanic adults will relate to levels of food insecurity. It was found that there is statistical significance between Hispanic adults educational attainment in relation to food insecurity. Generally the lower levels of education attainment resulted in higher chances of living in a food insecure household. Participants in this study resulted having a large portion only receiving their high school diploma. It was also hypothesized that Hispanic adults who have a high school diploma or higher will be less likely to live in a food insecure household. It was discovered that only having a high school diploma could still result in living in a food insecure household but chances slightly decreased as educational level increased.

Changes need to be made within the community in order to tackle food insecurity. As stated in the literature review, food insecurity is a nation wide problem. Based on this specific study, food insecurity is a nation wide problem among all ethnic groups. Specifically tackling this problem among Hispanics, it is important to consider all language barriers. Let the problem be known in different languages with different educational information easily accessible. There needs to be more programs available for all ages in regards to achieving a desired educational level. This goes along with program being offered in regards to food insecurity. Programs similar

to those mentioned before such as WIC and TANF. With more programs such as these it is also important that they be known within the public in order to increase awareness.

### **Strengths**

A strength within this study is the number of reported Hispanic adults who have claimed to have successfully completed some level of higher education. Based on the literature, the data often reports that Hispanics, next to African Americans, are the leading ethnic group that does not complete and attain a high school diploma, much less completion of any type of higher education above a high school diploma. Based on participant's responses on the 2016 CHIS, it was reported that among all 21,055 Hispanic adult participants the highest leading educational attainment group was a BA or BS level degree. These results compare to those found by the United States Census Bureau. The United States Census Bureau reported that between the years 2004 and 2013, Hispanics who earned either an associates degree or higher grew from 3.8 million graduates in 2004 to 6.5 million graduates in 2013 (2015). This educational attainment expansion among Hispanics resulted in a 71% increase within a nine-year period.

### **Limitations**

One limitation in this study was that the data was from a self-reported survey. Participant bias can possibly serve as a factor, indicating that participants who would not want to be embarrassed by certain questions will often times not answer them honestly. Participants not answering questions honestly may lead to misclassified data and/or not produce the desired outcome or results. By not answering questions honestly regarding educational attainment can possibly lead to falsification of data. When participants are not honest with their answers or falsify data, it can lead to misconstrued results. Conducting telephone interviews surveys may serve as a shortcoming because participants may not be answering correctly on these types of

data collection methods. Telephone interview surveys may also be too much in length in which participants may tune out and get distracted, especially in the comfort of their own home.

Another limitation is that the CHIS data is limited to the state of California. Completion of higher education and food insecurity is a worldwide problem, but currently a rising problem throughout the United States. In order to collect more information pertaining to the United States it would be wise to collect data from a nation wide survey that also collects data based on educational attainment. Previous literature and data have found that in 2015, the highest level (88%) of educational attainment in the United States among adults earned their high school diploma (United States Census Bureau, 2015). Collecting data from a nationwide survey could possibly serve more accurate findings concerning Hispanic adults (or any ethnic group adults) educational attainment and food insecurity.

Another limitation is that this specific study only looked at Hispanic adults and food insecurity in relation to educational attainment. Food insecurity and completing higher education is a nationwide concern. Exploring all ethnic groups and their correlation between education and food security can possibly lead a decrease in health disparities and reaching goals of a healthier nation, hence *Healthy People 2020*. One last limitation is that CHIS collects participant information from one adult per household. There can be multiple adults living in one household, more specifically more than one adult living a food insecure household.

One more limitation is the age range that was included in this study that focused on Hispanic adults. All adults 18-85 and over were included in this specific study. Including 18 year olds can be a limitation because not all 18 year olds have completed their educational. On the average, those 18 years of age would have completed a traditional high school curriculum or a General Education Development test (GED) and obtained their high school diploma. This can

possibly serve as a confounding variable for Hispanics educational attainment in relation to food insecurity.

### **Conclusion**

There are several health disparities that Hispanics face as a group. More specifically, literature has shown that Hispanic adults are more likely than any other ethnic group to face health disparities such as food insecurity in relation to their educational attainment. The National Center for Campus Public Safety reported that Hispanics had lower levels of educational attainment compared to their counterparts (2015). The United States Department of Agriculture (USDA) reports that one of the leading health disparities among the Hispanic culture is food insecurity, in which 22.4% of Hispanic households living in the U.S. were food insecure in 2014 (United States Department of Agriculture, 2018). This study sought to assess Hispanics educational attainment in relation to food insecure households in California based off the 2016 California Health Interview Survey (CHIS). There was statistical significance between educational attainment among Hispanic adults and food insecurity. The results of this study has shown that barriers to education can possibly lead to Hispanic adults living in a food insecure household in California.

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